Catalogue

OF

RUMINANT MAMMALIA.

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CATALOGUE

OF

RUMINANT MAMMALIA

(PECORA, Linnæus)

IN THE

BRITISH MUSEUM.

BY

JOHN EDWARD GRAY, F.R.S., F.L.S., &c.

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PREFACE.

This Catalogue contains an account of all the specimens of Ruminant Mammalia (*Pecora*, Linnæus) and their bones contained in the Collection of the British Museum, and a description of the specimens which are contained in other collections, in order to show what are the very few species that are desiderata to the Museum Collection.

JOHN EDWARD GRAY.

British Museum,
February 12, 1872.

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CATALOGUE

OF

RUMINANTS

(PECORA, *Linn.*).

Order PECORA.

Teeth of two or three kinds. Cutting-teeth 8 below; grinders 6 on each side in each jaw; canines more or less developed; grinders all similar.

Stomach complicated. Gullet with two long pouches just before the stomach, used for holding and soaking the food before it is chewed. Front of upper jaw toothless, callous, rarely toothed with sharp-edged teeth. Toes in pairs; bones of both the metacarpus and the metatarsus united. Hoofs triangular, rarely compressed.

Using the head and horns for defence.

Bovidæ, *Gray, Cat. Ungul. B. M.* p. 8.

The front edge of the jaw in *Camelidæ* alone is provided with cutting-teeth.

The metacarpal (and metatarsal) bones are united into a single bone called the *cannon*, except in *Hyæmoschidæ*, where they are separate.

The males and generally females furnished with a prominent long process on each frontal bone, which is either permanent during the life of the animal, with the upper part extended and permanently covered with a sheath or with hairy skin, or it developes into a definite shape covered with a hairy skin during the time of development, and eventually falls off, to be again developed.

The Ruminants may be divided, according to their horns, thus :—

I. The males and generally the females furnished with a bony process on each frontal bone, which is permanent during the lives of the animals.

In the Bovidæ this bony process is covered with a permanent horny sheath.

The horn (*coleoceras*) has the same appearance, form, structure, and is enlarged in the same manner as the hoofs over the toes.

In the Antilocapridæ the bony process is covered with a porous horny coat, which falls off and is renewed annually.

The horn or pseudo-horn (*komeceras*) of the Cabrit is *sui generis*. It seems to be formed of the matted or felted hair of the skin that covers the core. It loosens and falls off in the mass when the new coat of matted hair is formed beneath it. The horns may be compared to the annual coat of matted hair which is shed by the American Bison and some other ruminants ; but in that animal the hair only forms a kind of blanket, and falls off in flakes of different sizes.

In the Giraffidæ the bony process is covered with a skin like the rest of the body, and equally permanent, and the horn (*dermoceras*) covered with hair that is shed and renewed like the hair of the body.

II. The males and sometimes the females are periodically furnished with horns, which, during development or expansion, are covered with a vascular skin coated with down, the skin falling off when the horns are perfect and solidified, and the horns themselves falling off at the end of the season (Cervidæ). In some few the horns spring from the end of a permanent elongated bony process, as in the Muntjac.

The antler (*epocheceras*) of the Deer differs from the horns of the other ruminants in being a periodical development of bone, which is at first covered with a hairy skin, that dries up and falls off.

III. Neither sex provided with any horn-like process of the frontal bone, as the Musk (Moschidæ), Camels, Llama (Camelidæ).

Mr. Sclater, in his paper on *Antilocapra* (Ann. & Mag. Nat. Hist. 1866, xviii. p. 403), proposes the following arrangement of the Ruminants :—

I. Ruminantia phalangigrada.
1. *Camelidæ*.
II. Ruminantia unguligrada.
a. Placenta polycotyledonaria. Stomachus &c.
a'. Pedes didactyli, ungulis succenturiatis nullis.
2. *Camelopardalidæ* ; 3. *Antilocapridæ*.
b'. Pedes tetradactyli, ungulis succenturiatis duabus.
4. *Bovidæ* ; 5. *Cervidæ* ; 6. *Moschidæ*.
b. Placenta diffusa. Stomachus &c. (See A. Milne-Edwards, Zool. Record, i. p. 29.)
7. *Tragulidæ*.

" Dr. Gray, referring to this arrangement, 'regrets that the author, adopting Sundevall's division, changed Sundevall's term *Digitigrada* into *Phalangigrada*.' He doubts the applicability of the form of the placenta to zoological classification, reminding us of the scanty

information we possess at present on this subject; and points out several instances of *Bovidæ* without false hoofs. (To which Mr. Sclater replies, *ibid.* 1867, xix. January, p. 58)."—*Zoological Record*, 1866, p. 35.

Synopsis of the Families.

Suborder I. **CAVICORNIA.** Front of upper jaw callous, toothless. The horn-like prominences of the frontal bone permanent, covered with a permanent horny sheath. False hoofs distinct, very rarely absent.

Section I. **Levicornia.** Horns round or compressed, without any raised keel on the inner front side.

A. *Nostrils open, bald within; nose ovine or bovine.*

* *Nose bovine, with a moist naked muffle.*

Fam. 1. Bovidæ. Nostrils open, bald within; nose bovine; muffle large and moist. Horns smooth, spread out on the sides, cylindrical or depressed. Tail elongate, equine or bovine. False hoofs well developed.

Fam. 2. Heleotragidæ. Nostrils bald within, open; nose bovine; muffle large, naked, moist, callous when dry. Crumen distinct, rarely very small. Horns conical, annulated at the base, rarely present in the female. Face tapering. Crown rarely crested. False hoofs distinct.

Fam. 3. Cephalophidæ. Nostrils open, bald within; nose bovine. Crown crested, with a glandular longitudinal line. False hoofs distinct.

Fam. 4. Peleadæ. Nostrils open, bald within (?); nose swollen, soft, bovine. Crumen none. Horns conical, slender, erect, cylindrical at the base. False hoofs distinct.

Fam. 5. Nesotragidæ. Nostrils open, bald within; nose bovine. Horns conical, slender, cylindrical, ringed at the base. False hoofs none.

** *Nose ovine, covered with hair, without any muffle.*

Fam. 6. Oviboviдæ. Horns smooth, round, close together at the base, spread out on the sides. Tail very short. False hoofs well developed.

Fam. 7. Saigadæ. Horns lyrate, annulated. Nose high, compressed, truncated, hairy; nostrils open. Tail very short. False hoofs well developed.

Fam. 8. Antholopidæ. Horns elongate, lyrate, annulated at the base. Nose conical, ovine, of the males with a large dilatation at the outer side of the base of the nostrils. False hoofs distinct.

Fam. 9. Antelopidæ. Horns conical or compressed, ringed at the base. Nose tapering, ovine, simple. False hoofs distinct. Crumen generally large.

Fam. 10. Æpycerotidæ. Horns conical, compressed, ringed at the base. Nose tapering, ovine, simple. Crumen none. False hoofs none; pastern with tufts of rigid black hair on each side.

B. *Nostrils valvular, hairy within.*

Fam. 11. Connochetidæ. Nose broad, depressed, spongy, bristly, subequal. Horns conical, depressed at the base, and spread out at the sides. False hoofs distinct.

Fam. 12. Damalidæ. Nose conical, bovine, with a moderate naked muffle. Horns conical, compressed, more or less lyrate and annulated. False hoofs distinct.

Section II. **Angulicornia.** Horns subangular, with a more or less distinct ridge on the front angle. Nostrils open, bald within.

Fam. 13. Strepsicerotidæ. Horns subspiral, suberect, or inclined backwards. Nose cervine or bovine; nostrils near together in front. Forehead flat. Males not bearded on the chin. Fur white-banded or spotted. Females with four teats and a small udder.

Fam. 14. Capridæ. Horns erect, compressed, curved backwards, with a longitudinal keel in front, deeper than wide at base. Nose ovine or cervine; nostrils close together in front. Forehead convex, elevated behind. Chin of males bearded. Crumen none (?). Hoofs 4-sided, scarcely higher before than behind. Teats two, rarely four. Males emitting a strong stench.

Fam. 15. Ovidæ. Horns more or less spiral, wider than deep at base, slightly angulate in front, often wanting in the females. Nose ovine. Forehead flat or concave. Chin of males not bearded. Hoofs triangular, shallow behind. Males not emitting a strong stench.

Suborder II. **DICRANOCERA.** Front of upper jaw callous, toothless. Horn-like processes of the frontal bone permanent, covered with a hairy skin and a deciduous subhorny sheath formed of matted hair. False hoofs none.

Fam. 16. Antilocapridæ.

Suborder III. **DEVEXA.** Front of upper jaw callous, toothless. Horns permanent, on the coronal suture, between the frontal and parietal bones, covered with a permanent hairy skin ending in a tuft of hairs. False hoofs none. Intermaxillaries moderate, reaching to the nasals.

Fam. 17. Giraffidæ.

Suborder IV. **CAPREOLI.** Front of upper jaw callous, toothless. Horns deciduous, covered when young with a deciduous hairy skin; often wanting in the females, sometimes in both sexes. False hoofs distinct.

† *Antlers deciduous, generally branched, often wanting in the female. Tarsi hairy on the hinder side.*

Fam. 18. Alcadæ. Nose very broad, truncated, covered with hair, with only a very small central naked muffle. Young not spotted. Antlers expanded or palmated. Skull: nose-hole very large, nasal very short.—Arctic Regions.

Fam. 19. Rangiferidæ. Nose broad, entirely hairy, without any naked muffle. Antlers with a large anterior basal snag on the crown, palmated at the end. Skull: nose-hole moderate; intermaxillaries slender, just reaching the nasals. Young not spotted.—Arctic Regions.

Fam. 20. Cervidæ. Nose tapering, with a moist, naked muffle, without any gland up the face. Antlers branched, very rarely simple. Skull: nose-hole moderate.—Warm and temperate parts of both hemispheres.

Fam. 21. Cervulidæ. Face conical, with two longitudinal bony ridges supporting the antlers, with a longitudinal groove on their inner side. Muffle small, moist.—Asia.

†† *Antlers none. The tarsi mostly naked on the hinder side. Crumen none.* —Moschina, *Gray, Cat. Ungul. B. M.* p. 241.

Fam. 22. Moschidæ. Throat and hinder edge of the tarsus covered with hair. Upper canines much elongated. Metacarpal bones united into a cannon. Intermaxillaries elongate.—Asia.

Fam. 23. Tragulidæ. Throat and hinder part of the tarsus callous. Fur close-pressed, soft. Young coloured like the adult. Throat white-streaked. Metacarpal bones united into a cannon. Intermaxillaries elongate.—Asia.

Fam. 24. Hyemoschidæ. Horns none. Canines often elongate. Back of the tarsus bald, callous. Metacarpal bones separate in all ages. Metatarsal bones at first distinct, becoming united into a single bone. Intermaxillaries short, not reaching the nasal.—Africa.

Suborder V. **TYLOPODA.** Front of the upper jaw with 8 cutting-teeth. Horns none. Toes elongate, with a broad pad beneath. Hoofs compressed. False hoofs none.

Fam. 25. Camelidæ.

Suborder I. CAVICORNIA.

Front of upper jaw callous, toothless. The horn-like prominences of the frontal bone permanent, covered with a permanent horny sheath (*coleocerata*). False hoofs distinct, very rarely absent.

Bovina, *Gray, Cat. Ungul. B. M.* p. 12.
Bovidæ, *Gray, Ann. & Mag. Nat. Hist.* 1866, xviii. p. 328; *Sclater, l. c.* p. 403.

The false hoofs are only absent in two small families. The horn or horny sheath (*coleoceras*) has the same appearance, form, and structure as the hoof over the toes (see Ann. & Mag. Nat. Hist. 1866, xviii. p. 326).

Section I. LEVICORNIA.

Horns round or compressed, without any raised keel on the inner front angle.

The families belonging to this group arrange themselves in two nearly parallel series according to the form of the nose—that is to say, if it is bovine and has a naked muffle, or ovine or equine and has the nose covered with hair.

Those which have a naked muffle are generally considered to be grazers. No doubt this difference in the form of the nose is attended with very different habits; but I do not think that they have been carefully observed, so as to lead to any general conclusion on the subject. I have heard that those that have a hairy nose or ovine muffle are said to be grazers, and those with a muffle have been called browsers; but both sheep and oxen are essentially grazers, and the Giraffe, which has an ovine nose is a browser. All these animals use the tongue as an organ of prehension.

Nose bovine.		*Nose ovine.*
Bovidæ	Horns spread out on the sides	Ovibovidæ.
Heliotragidæ ..	Horns suberect	Saigadæ.
Cephalophoridæ		Pantholopidæ.
Peleadæ		Antilopidæ.
Nesotragidæ	False hoofs none	Æpycerotidæ.
Damalidæ	Nostrils hairy within	Connochetidæ.

The families may be arranged by the direction of the horns thus :—

1. Horns spread out on the sides. Bovidæ, Ovibovidæ, and Connochetidæ.

2. Horns more or less erect, sublyrate, or recurved. Heliotragidæ, Cephalopidæ, Nesotragidæ, Saigadæ, Pantholopidæ, Antilopidæ, Æpycerotidæ, and Damalidæ.

A. The nostrils open, bald within; nose ovine or bovine.

Fam. 1. BOVIDÆ.

The nostrils open, bald within; nose bovine; muffle large, moist. Horns smooth, spread out on the sides, cylindrical or depressed. Tail elongate, bovine or equine. False hoofs well developed.

Boveæ, *Gray, Cat. Ungul. B. M.* p. 15.

The horns smoothish, spread out on the sides, cylindrical or depressed at the base; situated on the frontal edge, and bent laterally outward, and recurved at the tip. The nose is broad, with the nostrils on the side. Crumen none. Skull has no suborbital pit or fissure. Grinders with well-developed supplementary lobe. The knee (or wrist) below the middle of the fore leg, the cannon bone being shorter than the forearm-bone.

1. *The tail elongate, subcylindrical, covered with short hair at the base and long at the tip. Muffle bovine, broad, and moist.*

A. OXEN.—*The hair short and rigid, shoulder and haunches equally high. Intermaxillary bones elongate, reaching to the nasals in the adult animal.*

1. BOS.

Horns cylindrical, conical, nearly circular at the base, curved upward and outward on the sides of the head (Gray, Cat. Ungul. B. M. p. 17, t. 1. f. 1, skull).

1. Bos taurus. (The Bull.) B.M.

Forehead flat, withers not humped.

Bos taurus, *Gray, Cat. Ungul. B. M.* p. 17, t. 1. f. 1 (skull).

Hab. Europe, Asia, Africa, America; always in a domestic state.

The British Museum purchased, at the sale of the property of the Earl of Mountnorris, at Arley Hall, the pair of horns of the Galla Oxen mentioned by Mr. Salt in his 'Voyage to Abyssinia,' p. 258, 4to edit., 1844.

"The horns are shorter, and more curved and lyrated than the figure engraved in t. 19, p. 259, of Salt's 'Travels in Abyssinia' (which also appears to make them bear a larger proportion to the size of the animal than the specimen suggests); and they are quite as remarkable for their erect position on the forehead as for their size.

"They and the core which supports them are very light, compared with their size, and not half the weight of the smaller wide-spreading horns of the long-horned Cape Waggon Oxen. The horns are thin, pale coloured, and of a loose texture, being worn and fibrous on the surface in several parts.

"In the lightness and very cellular structure of the core, the thinness of the horny coat, and the large size, they agree with the pair

of horns in the British Museum brought from Central Africa by Captain Clapperton, R.N., and Major Denham, R.E., which are figured in Griffith's 'Animal Kingdom,' iv. t. 201. f. 4; but these horns are shorter and much larger in diameter, and are spread out on the sides like those of the common domestic Oxen, and they are very much lighter for their size than those of the Galla Oxen or *Sanga*.

"Sir Richard Vivian has kindly informed me that he has seen a breed of cattle in Italy, with the horns rather erect, somewhat resembling those of the *Sanga* in position."—*Gray, Ann. & Mag. N. Hist.* 1855, xv. p. 66.

"These are domestic cattle [in China] that have for long had the run of the numerous mountains and peaks of the neighbouring Le. These have originated from cattle that were let loose to pasture and not collected to their stalls each night. Their dispositions have become wild, and they flee from the sight of man. To obtain them it is necessary to shoot them with a gun."—*Swinhoe, P. Z. S.* 1870, p. 237.

2. **Bos chinensis.** (The Yellow Cow of South China.) B.M.

Humped.

Bos chinensis, *Swinhoe, P. Z. S.* 1870, p. 648. f. 6 (animal), f. 7, 8 (skull and horns).

Hab. South China.

"The small Yellow Cow of South China is a peculiar race, combining, as it seems to do, the characters of *Bos indicus* of India and *Bos taurus* of Europe. It has the head and dewlap in character with the former, with a small hump, the straight back, and hind quarters of the latter. Mr. Blyth maintains that it is a cross between the two; and this opinion may perhaps be borne out by the fact that the North-Chinese large cattle are certainly like our European ordinary breed. In the 'Taiwanfoo Gazetteer' I read this passage under the head 'Yellow Cow:'—'The neighbouring hills have this animal in abundance. They are caught and tamed, and are trained for use in the ploughing of fields and drawing of carts;' and further on, 'Formosa has an abundance of wild cattle, occurring in herds of hundreds and thousands. When it is desired to capture them, a wooden stockade is erected with four sides, in one of which is left a door. The cattle are driven towards it until they all enter, when the gate is shut on them and they are barred in and left to starve. They are afterwards by degrees haltered and bridled and treated to fodder and beans, until they become not different from domestic cattle.'

"I take it that the wild Formosan Cow was indigenous to Formosa, and of the same species that ranged throughout South China, from which the present domestic cattle of the south are derived. I have not heard of its being found wild in the present day in China; and in Formosa the wild race has almost, if not quite, disappeared. In the central mountains they are kept in a semi-wild state, and from

there I procured the skulls of an adult male and female and a live bull. The bull I had photographed [it is figured P. Z. S. 1870, p. 648. fig. 6]; and the skulls are deposited in the British Museum. The figure shows a better and stronger build than ordinary South-China cattle possess, and proves the two to be of the same race. The Chinese have done little to improve their breed of cattle; and you may see this kind in the country from Canton to Ningpo unchanged in form or shape of horns, but, as a rule, a little smaller and more degenerate than the wilder animals from the Formosan mountains. The skull of the bull [*l. c.* p. 649. figs. 7 & 8] measures 19·5 inches in length; the horns are somewhat conical, measure 8 inches in length each, and stand outwards and backwards. The animal is a rich chestnut-brown, with whitish underparts and feet. Its horns and hoofs are black."—*Swinhoe, l. c.* p. 648.

3. **Bos indicus.** (The Zebu.) B.M.

Forehead convex; withers with a more or less fleshy hump.

Bos indicus, *Gray, Cat. Ungul.* p. 21.

Hab. India.

Varies greatly in size; always in a domesticated state.

4. **Bos dante.** (The Dante.) B.M.

Face rather narrow; forehead very flat, with the horns on the side of the high occipital ridge; withers with a small but distinct hump.

Bos dante, *Gray, Cat. Ungul. B. M.* p. 22.

Hab. Africa, North and West.

2. BUBALUS.

Horns depressed and subtrigonal at the base, inclining upwards and backwards, conical, and bending upward at the tip. (Gray, Cat. Ungul. B. M. p. 23, t. 1. f. 2, skull.)

* *Head elongate, narrow, a longitudinal groove over the orbit. Forehead flat. Horns distant at the base, more or less elongate, bent outwards and backwards, and scarcely incurved at the tips. Ears moderate.* Bubalus.

1. **Bubalus buffelus.** (The Buffalo.) B.M.

Bubalus buffelus, *Gray, Cat. Ungul. B. M.* p. 25.

Hab. South Europe, North Africa, India, and Indian Islands.

Colonel James Matthie presented to the British Museum the skull and horns of an Arnee or Buffalo, killed by him near Fezpoor, Central Assam, on the 8th of April, 1842. The horns are of a very large size, as proved by the accompanying measurements, being nearly as large as the separate horns, without a skull, in the British Museum, which formerly formed part of Sir Hans Sloane's Collection,

and were described and figured by him in the 'Philosophical Transactions' for 1727, no. 397, p. 222, f. 23.

These horns are 78 inches, or 6 feet 6 inches long.

The dimensions of Colonel Matthie's specimen are as follows, according to his measurement :—

	ft.	in.
"Length of the skull from occiput to nose	2	4
Length of the horns round the outside of them and across the forehead	12	2
Length of line from tip to tip of horns	6	8
Circumference of right horn at base	1	8½
Circumference of left horn at base	1	8
Width across the forehead	0	11

"The horns do not exactly correspond in length and shape." The occipital portion of the skull is very much developed, to give enlarged attachment to the muscles of the neck for the support of the horns.

The Arnee of Anderson, 'Bee,' 1792 (the *Bos arnee* of Kerr, 'Animal Kingdom,' p. 336, t. 295, copied into Shaw's 'Zoology,' iv. p. 400, t. 210), is only a large horned variety of the common Buffalo, with horns nearly regularly curved from the base. The horns presented by Colonel Matthie, on the other hand, are nearly straight for a great part of their length, and only curved at the end. In this respect they agree with the horns (in the British Museum) which Mr. Doyle, whose name is "given to a sort of stuffe worn in summer," discovered in a cellar in Wapping, and which he gave to Sir Hans Sloane for his kindness in attending him in sickness. These are described by the latter in the 'Philosophical Transactions' for 1727, no. 397, p. 222, f. 33; and redescribed and figured by Colonel Hamilton Smith as those of *Bos arnee* in Griffith's 'An. Kingd.' iv. t. 201. f. 2, 3.

Dr. Hook read a lecture on Mr. Doyle's horns at Gresham College, and thought they were probably those of the *Sukotyro* or *Sucotaria*, described by Nieuhof, in his 'Voyages and Travels in the East,' as found at Java. He compares the horns to the tusks of the Elephant, which they somewhat resemble. Dr. Shaw thought otherwise, and formed a genus for Nieuhof's animal, making a figure of it from his description (see 'General Zool.' i. p. 226, t. 65). Illiger considered it more probably a Babyrusa. See Illiger, 'Genera Mam.' p. 100. (Gray, Proc. Zool. Soc. Jan. 23, 1855; Ann. & Mag. N. Hist. 1855, xvi. p. 230.)

** *Head short, broad. Horns depressed, flat, separate or nearly close together at the base, diverging outwards and backwards: tips more or less incurved behind the base of the horns. Ears very large, fringed.* Planiceros.

2. **Bubalus brachyceros.** (The Zamoose.) B.M.

Horns far apart at the base, bent obliquely outwards and then backwards; forehead flat, with a large subtriangular deep cavity over the orbits.

Bubalus brachyceros, *Gray, Cat. Ungul. B.M.* p. 24, t. 1. f. 2 (skull

of young); *Ann. & Mag. N. H.* 1861, vol. vii. p. 468; *Blyth*, *P. Z. S.* 1863, p. 158, f. 1, 2 (head of adults); 1866, p. 373, fig. (animal, young).

Hab. West Africa: Gambia (*Whitfield*), Gaboon (*B. M.*). Central Africa (*Clapperton*).

"Who could believe that the 'Naïve' (the Wild Bull of Equatorial Africa)—'*Bos brachycheros*' on the plate at p. 175 of Du Chaillu's Travels, and again on the plate entitled 'the Leopard and his prey,' at p. 125, and also where it is shown tossing a native, at p. 204—is the same animal as *Bos brachyceros* described by me in the 'Magazine of Natural History' for 1837, and in the 'Annals of Natural History,' vol. vii. p. 284, t. 13? Yet the specimen in the collection leaves not the slightest doubt on the subject; and also shows that the position of the horns in each of these three representations is not consistent with nature, for they are all represented as having the horns recurved from the root, while they ought to have been represented as spreading out on the sides, and only recurved at the tips; so that persons who might be inclined to doubt the identity of my *Bos brachyceros* and M. Du Chaillu's *Bos brachycheros* (which, by the by, at p. 174, and again at p. 306, he calls 'a quite new and hitherto undescribed species of Buffalo') must not be led away, by this inaccuracy in the representation of the animals, to believe the traveller's statement, and regard the two animals noticed under such nearly similar names as two species.

"As to the animal being 'new and undescribed,' I may state that it and its habits were described by Denham and Clapperton, who brought home a head of it, now in the British Museum, under the name of the 'Zamouse;' that it was described and figured by me in 1837, as above referred to; and that it was described by Dr. Rüppell as found in Abyssinia.

"I may observe that I am not inclined to place more reliance on his statement of the habits of this animal than the figures lead us to place in his accuracy as regards the representation of it. He describes it, at p. 124, as 'a very savage beast,' and at p. 306 remarks, 'I do not think the *Bos brachycheros*, the wild bull of this country, could be tamed.' The specimen which I described, on the contrary, lived for some years in the Surrey Zoological Gardens, and then went to the Jardin des Plantes at Paris, where it died; its skin is preserved in the Museum of that Institution. It was as tame and gentle as our common cattle. It is well known at Sierra Leone as the Bush Cow, and appears to be generally distributed over intertropical Africa."—*Gray*, *Ann. & Mag. N. H.* 1861, vol. vii. p. 468.

3. Bubalus centralis. B.M.

Horns close together, but separate at the base; moderately long; spreading out horizontally on the sides, and then recurved and incurved at the tip. Only a small groove over each orbit.

Bos brachyceros (*Gray*?), *Heuglin*, *Buffles*, t. 3. f. 12, 12*a* (skull.

adult); *Pel, Bijdrag Dierkunde*, p. 33, t. 1 & 2 (skull and horns, adult).

Hab. Central Africa (*Baikie*, B.M.); North-east Africa (*Heuglin*); Guinea (*Pel*).

The specimen of the skull in the British Museum, which appears to be older than the others, has horns not more than an inch apart, while those figured by Pel and Heuglin are further apart; but this may be caused by the age of the animal.

a. *Bos planiceros*, Blyth, P. Z. S. 1863, p. 157, fig. 4, 1866, p. 371. Horns in the Museum of King's College, and second in the "Museum of the Royal College of Surgeons, in the catalogue of which it has been assigned to the Gayál (*Bos frontalis*) of Transbrahmaputran regions, to which species it was not even specifically allied—it being unquestionably the frontlet of a veritable Buffalo, and of the African type, as distinguished from the Asiatic, as exemplified by *Bubalus caffer* and *B. brachyceros*."—*Blyth, P. Z. S.* 1863, p. 157, f. 4.

b. *Bubalus caffer*, var. *equinoctialis*, Blyth, P. Z. S. 1866, p. 372, f. 1 & 1*a*. Described from a frontlet obtained in Equatorial Africa by Mr. Petherick, and probably is the same species with the horns quite united at the base, which may depend on age.

4. Bubalus reclinis. B.M.

Horns very nearly close together at the base, and flat, directed backwards, incurved, and nearly touching at the tip.

Bubalus caffer, jun., *Gray, Cat. Ungul. B. M.* p. 28, t. 2. f. 3 (horns).
Bos reclinis, *Blyth, P. Z. S.* 1863, p. 158, f. 3.

Hab. Africa. Horns (from Mus. R. S.) only known.

*** *Skull short. Forehead convex on each side. Horns much enlarged and, in adults, close together at the base, spread out on the side of the head, and recurved at the tips, which are bent forward over the horns; ribs very wide.* Synceros.

5. Bubalus caffer. (The Cape Buffalo.) B.M.

Bubalus caffer, *Gray, Cat. Ungul. B. M.* p. 28, t. 2. f. 2 (skull); *Blyth, P. Z. S.* 1866, p. 372, f. 2 (horns).

Hab. South Africa; Central Africa. In heavy grass.

3. ANOA.

Horns subtrigonal, nearly parallel, round at the top, depressed at the base, slightly keeled on the inner edge, straight, nearly on the plane of the face, on the hinder edge of the frontal ridge. Intermaxillary elongate, high up between the maxillaries and the nasals. (Gray, Cat. Ungul. B. M. p. 29, t. 3. f. 1 & 2, skull and horns.)

1. **Anoa depressicornis.** (The Anoa.) B.M.

Anoa depressicornis, *Gray, Cat. Ungul. B. M.* p. 29, t. 3. f 1 & 2 (skull).

Hab. Celebes.

4. BIBOS.

Horns on the hinder edge of the frontal bone, which is often very prominent, depressed at the base, directed outwards, recurved at the tip. Withers high, keeled, supported by the spinous processes of the dorsal vertebræ, and suddenly lower behind. The intermaxillary moderate, not reaching to the nasal. (Gray, Cat. Ungul. B. M. p. 31, t. 3. f. 3, skull.)

† *Forehead flat. Horns broad, depressed. Front half of back with a longitudinal keel.* Probos, *Hodgson.*

1. **Bibos frontalis.** (The Gayal.) B.M.

Bibos frontalis, *Gray, Cat. Ungul. B. M.* p. 31, t. 3. f. 3 (skull).
Bos frontalis, *Gray, P. Z. S.* 1852, p. 96, & 1866, t. 1.

Hab. India: Nepaul, Chittagong.

Sclater

†† *Forehead concave. Horns pale, rather depressed at the base. Back with a prominent keel over the shoulders, and another on the middle of the back.* Bibos, *Hodgson.*

2. **Bibos gaurus.** (The Gour or Gaur.) B.M.

Horns depressed and broad at the base. Skull short, subtriangular, very broad behind, and with a very high occipital crest; nose rapidly tapering from the orbits; nasal bones broad.

Bibos gaurus, *Gray, Cat. Ungul. B. M.* p. 32; *Elliot, Madras Journ. N. H.* x. p. 227, t. (skull).

Hab. India: Nepaul.
Skull: length 22 inches, width just in front of the base of the horns 10 inches.

3. **Bibos banting.** (The Banting.) B.M.

The horns nearly circular at the base. Skull oblong, elongate, rather broad behind, with a moderate occipital crest; nose gradually tapering; nasals narrow, elongate.

Bibos banting, *Gray, Cat. Ungul.* p. 35.
Bos sondaicus, *Müll. Nederl. Verhand.* i. t. 35, 36 (♂ & ♀), t. 37, 38, 39 (skull and horns).

Hab. Java.
Skull: length 21 inches, width just in front of the base of the horns 8½ inches.

B. Bisons.—*Covered with short, crisp wool. Shoulder higher than the haunches. Cannon-bone of the hind leg longer than the fore. Ribs fourteen or fifteen pairs. Intermaxillaries very short, not nearly reaching the nasals.*

5. BISON.

Muffle short and scarcely reaching the hinder edge of the nostrils, as wide as the space behind the inner edge of the nostrils. Horns round, rather depressed at the base, lateral, coming out before the edge of the occiput, curved upwards and outwards. Skull: the frontals are broader than long. (Gray, Cat. Ungul. B. M. p. 35, t. 4. f. 1, 2, skull.)

1. Bison bonassus. (The Bison.) B.M.

Tarsi elongate; fore and hind quarters subequal.

Bison bonassus, *Gray, Cat. Ungul. B. M.* p. 36.
Bison americanus, *Gray, Cat. Ungul. B. M.* t. 4. f. 1, 2 (skull).

Hab. Poland and Caucasus.

2. Bison americanus. (The American Bison.) B.M.

Tarsi short; hind quarters very low.

Bison americanus, *Gray, Cat. Ungul. B. M.* p. 38; *Cuvier, Oss. Foss.* (skull).
Bos americanus, *Baird, Mam. N. A.* p. 682.

Hab. North America.

2. *Tail elongate, equine, covered with long hair from the base. Muffle subbovine, rather narrow below. Hair during the cold season very long and pendent. Intermaxillaries elongate, not reaching quite to the nasals.*—Yaks.

6. POËPHAGUS.

Horns subcylindrical, curved outwards on the front of the occipital ridge. Nose hairy, with a moderate-sized bald muffle between the nostrils. Hoofs moderately thick, not dilated or expanded on the outer side, square, and straight in front. (Gray, Cat. Ungul. B. M. p. 39, t. 5. f. 3, 4, skull and horns).

1. Poëphagus grunniens. (The Yac or Sarlyk.) B.M.

Black; back and tail often white.

Poëphagus grunniens, *Gray, Cat. Ungul. B. M.* p. 40, t. 4. f. 3, 4 (skull and horns).

Hab. Thibet.

"The *young calf* is black, with a tuft of long pale yellow hair across the crown of the head; the underside of the body and the tail are covered with rather long pale yellow hair; the dorsal streak, which is broader over the withers and rump, and interrupted on the middle of the back, is white."—*Gray, P. Z. S.* 1853, p. 191, pl. 35. B. M.

Fam. 2. HELEOTRAGIDÆ.

Nostrils bald within, open. Nose bovine. Muffle large, naked, moist (callous when dry). Crumen distinct or rudimentary. Horns conical, annulated at the base, rarely present in the female. Face tapering, crown rarely crested. False hoofs distinct.

True Antelopes, section *b*, *Gray, Cat. Ungul. B. M.* p. 67.
Antilopea cervina (Cervine Antelopes), *Gray. Ann. & Mag. Nat. Hist.* 1846, p. 324.

Subsection I. WATER-BOCKS.—*Tail elongate, subcompressed, with a ridge of hair above and tufted at the end. Horns in male only, sublyrate, strong, bent forward or recurved over hinder part of orbit, on frontal ridge. Body heavy, legs slender. Crumen rudimentary, covered with a tuft of hair.*

* *Head and skull short and high, without any preorbital pit, but with a large interorbital fissure; first molar with a supplementary lobe.*

1. KOBUS.

Tail rather elongate, depressed, hairy on the sides. Horns only in the male, elongate, sublyrate, bent back and then forward at the tip. Hair rough and elongate. Neck covered with longer diverging drooping hair. (Gray, Cat. Ungul. B. M. p. 99, t. 11. f. 3, 4, skull.)

A. *Horns lyrate, ascending, slightly curved; tips straight, bent rather forward.*

1. **Kobus ellipsiprymnus.** (Photomok or Water-Buck.) B.M.

Brownish; rump with a whitish elliptical ring near the base of the tail. Horns converging at the tip.

Kobus ellipsiprymnus, *Gray, Cat. Ungul. B. M.* p. 99, t. 11. f. 3, 4 (skull); *Heuglin, Antil.* p. 16, t. 2. f. 10 (horns).

Hab. South Africa; East Africa: Uzaramo (*Speke*); Sobat, (*Heuglin*).

2. **Kobus sing-sing.** (The Sing-Sing, or Defassa.) B.M.

Rump without any pale ring.

Kobus sing-sing, *Gray, Cat. Ungul. B. M.* p. 100.
Sing-Sing?, *Selater, P. Z. S.* 1864, p. 102 (figure of head and foot); *Murie, P. Z. S.* 1867, p. 3, t. 2.
Kobus defassa, *Heuglin, Antilopen*, p. 15.

Hab. West Africa, Gambia: called Jackass-Deer: half domesticated. East Africa, Uganda (*Speke*).

Dr. Murie describes a specimen from the White Nile; and having compared it with other specimens from other parts of Africa, he believes it ranges from Senegal to Abyssinia, and southwards nearly to the equator.

3. Kobus leucotis. (The Nsunnu.) B.M.

"Adult male the size of *A. kul*; blackish sooty; underside, ears, orbits, and front of orbits white to the forehead; nasal region whitish fulvous; forehead, cheeks, and tail black; horns olive-brown, blackish at tips. Younger male bay; back brownish; underside, ears, apex of the nose, orbit, and temples white. Female reddish fulvous; limbs partly blackish."—*Heuglin.*

Antilope leucotis, *Licht. et Peters, Monatsb. Akad. Berl.* 1853, p. 164: *Abbild.* 1855, p. 96, t. 3.
Adenota leucotis, *Heuglin, Ant. Leopold. Acad.* t. 1. f. 4 (head).
Kobus leucotis, *Gerrard, Osteol. Specim.* p. 239; *Selater, P. Z. S.* 1864, p. 103.

Hab. East Africa: Uganda, "never go far from water" (*Speke*).

Three heads and horns in the British Museum: in two the head is pale brown (one of these has the upper part of the nose varied with black); the third has the nose, forehead, and cheeks blackish. All have the end of the nose, side of the forehead, the orbits above and below, and the lower side of the head whitish. The horns differ greatly in thickness; all corrugated nearly to the tip, and longitudinally grooved between the corrugations. Capt. Speke's specimen has much the thickest.

B. *Horns elongate, bent back, strongly arched; tips incurved.*

4. Kobus Maria. (The Abok.) B.M.

Head of *male* blackish brown; lips, chin, gullet, orbits, and temple enclosing the base of the ears, and the ears, whitish; the sides of the nose brownish; the hair of the cheek, side of the lower jaw, gullet, and upper part (all that remains) of the neck elongate, rigid; the horns elongate, rather slender, widely lyrate, with very strong transverse ridges and incurved tips.

Head of *female* brown, with the chin and gullet, base of the ears, and two small spots (one over the front and the other behind the lower edge of the eye) whitish; the hair of the head black, with brown tips; of the lower part of the cheek, lower jaw, and neck very long. Hornless.

Kobus Maria, *Gray, Ann. & Mag. N. H.* 1859, iv. p. 297 (figure of head); *Wiegmann's Archiv*, 1860, p. 285 (figure of head).
Adenota megaceros, *Heuglin, Antilopen*, p. 14, t. 2. f. 7, 8 (head and horns).

a. *Kobus*, sp. ?—"Uganda. Imperfect head of female, probably of a species of *Kobus*. Native name 'Ndjezza.'

"The 'Ndjezza' is found among the grasses near water in Uganda. I never obtained the male of this Antelope.—*J. H. S.*" (*Sclater, P. Z. S.* 1864, p. 103).

b. *Mehedehet Antelope*, Baker, Albert N'yanza, ii. p. 15 (figure of head).—*Hab.* Obbo, Central Africa. Feeds upon the rich low grass of a sandbank in the very centre of the river.

"Weight 600 lbs., stands 13 hands high, with rough brown hair like the Sambur Deer of India."

Horn of the figure sublyrate, rugose; ears small; face short, conical.

2. ADENOTA.

Muffle cervine, cordate, moderate. Nose hairy between and over the nostrils. Horns sublyrate, ringed, in males only, in young recurved. Hair of back whorled, of dorsal line and back of head reversed. Tail rather short, hairy, crested. (Gray, Cat. Ungul. B. M. p. 96, t. 11. f. 2, skull; *Hydrotragus*, Fitzinger, p. 48.)

1. Adenota kob. (The Æquitoon.) B.M.

Pale brown. End of nose, inside of ears, chest, belly, inside of legs and thighs, tip of tail, and band above the hoof white; front of fore and hind legs and end of ears and tail black. Hair of dorsal line reversed, with a whorl on the shoulders and loins.

Adenota kob, *Gray, Cat. Ungul. B. M.* p. 96, t. 11. f. 1, 2 (skull).

Hab. West Africa: Gambia.

a. *Adenota kul.* (The Kul or Kuhl.) The male the size of *A. Sœmmerringii*, blackish, whitish beneath, with a large white frontal tuft. The female fulvous cervine, beneath paler; part of the limbs and spot before the eye brown. (Heuglin, Antilop. p. 12.)—*Hab.* South Kordofan.

b. *Adenota wuil.* (The Wuil.) Male size of *A. Sœmmerringii*, underside sooty; cervical and frontal streak and circumference of the eyes greyish white. (Heuglin, Antilop. p. 13.)—*Hab.* Sobat (*Heuglin*).

3. ONOTRAGUS.

Tail elongate, slender, with a crested tuft at the end. Horns elongate, sublyrate, recurved at the tip; strong, nodose in front. Hair of back whorled. Skull, ♀, Tab. II. f. 4.

Adenota, section **, *Gray, Cat. Ungul. B. M.* p. 98.

1. Onotragus lechèe. (The Leehèe.) B.M.

Pale brown; orbits and lower part of body whitish; front of legs dark brown. Skull, ♀.

Heleotragus lechè, *Kirk, P. Z. S.* 1864, p. 658.
Adenota lechèe, *Gray, Cat. Ungul. B. M.* p. 98; *P. Z. S.* 1850, tab. xx.

Hab. South Africa (*Vardon*); Central Africa (*Petherick*).
Heuglin thinks this is the young male of his *A. megaceros.*

2. Onotragus Vardonii. (The Poku.) B.M.

Antilope Vardonii, *Livingstone, Mission. Trav.*
Heleotragus Vardonii, *Kirk, P. Z. S.* 1864, p. 657.

Hab. Central Africa, in marshes of the Chobe and Zambesi. Known from *O. lechèe* by its smaller size, more erect carriage, and plumpness of neck; the horns are less turned backwards, and partake more of the character of the *Reitbock*.

4. ELEOTRAGUS.

Tail moderate, bushy, covered with rather long hair. Horns conical, diverging, and bent forward at the tip. Fur harsh, of the back more or less whorled. Nasal opening in the skull rather elongate. Intermaxillary bones not quite reaching the nasals. Muffle rather large. (Gray, Cat. Ungul. B. M. p. 91, t. 10. f. 3, skull.)

1. **Eleotragus arundinaceus.** (Inghalla or Reitbock.) B.M.

Fur grizzled, harsh, straight, with a subterminal pale band and often whorled. Head broad; temple with a naked spot; muffle large, flat, extending behind the nostrils.

Eleotragus arundinaceus, *Gray, Cat. Ungul. B. M.* p. 91, t. 10. f. 3 (skull).
Antilopa eleotragus, *Reichb.* p. 98, t. 29. f. 171.

Hab. South Africa.

"The curvature and divergence of the horns varies greatly in different specimens."—*Kirk, P. Z. S.* 1864, p. 657.

2. **Eleotragus reduncus.** (The Wonto, or Nagor.) B.M.

Fur not grizzled; hair grey, yellow-tipped. Head broad; muffle small, scarcely extending beyond the nostril behind; tail only slightly bushy.

Eleotragus reduncus, *Gray, Cat. Ungul. B. M.* p. 94.

Hab. West Africa: Gambia, Senegal.

Var. *bohor*. Larger and brighter-coloured. (Gray, *l. c.* p. 94.)
Hab. East Africa: ~~Abyssinia~~ (*B.M.*), Usagara (*Grant*).

Subsection II. CHOUSINGHAS.—*Tail moderate, hairy above. Horns four, the hinder at the hinder end of the frontal bone, far behind the orbit; front conical over the front edge of the orbit. Crumen longitudinal.* Asia.

5. TETRACERUS.

Horns in males only, four; front pair very short. Muffle large; suborbital fossæ large, shallow, occupying nearly the whole cheek of the skull. (Gray, Cat. Ungul. B. M. p. 67, t. 9. f. 1, skull, male.)

1. **Tetracerus quadricornis.** (The Chousingha.) B.M.

Front pair of horns conical, distinct.

Tetracerus quadricornis, *Gray, Cat. Ungul. B. M.* p. 68, t. 9. f. 1 (skull).

Hab. India, Nepal, and Thibet.

See also *Tetracerus iodes* and *T. paccervis*, Hodgson, Cat. Ungul. p. 69.

2. **Tetracerus subquadricornutus.** (The Jungliburka.) B.M.

Front pair of horns rudimentary, tubercular; hinder conical, subcylindrical. Pale brown, sides rather paler; chest, belly, inner side and front of legs whitish; feet paler, varied. Female: front of legs blackish.

Tetracerus subquadricornutus, *Gray, Cat. Ungul. B. M.* p. 70.

Hab. India: Madras.

Subsection III. STEINBOCKS.—*Tail moderate, compressed, hairy above. Horns two, over the orbits, in males only, conical or subulate. Crown not crested. Crumen distinct, transverse. Body and limbs light and graceful. Hoofs small, and hair of body rigid.* Africa.

6. CALOTRAGUS.

Horns two, over the orbit, in male only, subulate, elongate, erect. Crumen arched, transverse. Hoofs triangular. Ears large.

1. **Calotragus melanotis.** (The Grysboc.) B.M.

Calotragus melanotis, *Gray, Cat. Ungul. B. M.* p. 72.
Antilopa melanotis, *Peters, Mossamb.* p. 187.

Hab. South Africa: Usui (*Speke*), Teete (*Peters*).

7. SCOPOPHORUS.

Horns over the orbits, subulate, elongate, acute, slightly recurved at the tip. Crumen transverse. Knees largely tufted. Hoofs triangular. Ears moderate. (Gray, Cat. Ungul. B. M. p. 73.)

Forehead flat, short; nose much compressed; cheeks deeply concave to the orbit, from which the concavity is only separated by a slight ridge. (Peters Mossamb. t. 41, 42.)

1. **Scopophorus ourebi.** (The Ourebi.) B.M.

Temple-spot small, indistinct.

Scopophorus ourebi, *Gray, Cat. Ungul. B. M.* p. 73.

Hab. South Africa: Natal.

2. **Scopophorus montanus.** (The Gibari.) B.M.

Temple-spot large, deep (more than half an inch over) naked.

Scopophorus montanus, *Gray, Cat. Ungul. B. M.* p. 74.
Calotragus montanus, *Heuglin, Antilopen*, p. 8.

Hab. East Africa: Abyssinia; Karawjah, in small herds (*Speke*). West Africa: Gambia, Nubia, and Kordofan.

a. *Antilope hastata*, Peters, Mossambique, 1849, t. 40 (animal), 41 & 42 (skull and horns). S. Africa, Sena Chupanga. The same or only a slight variety of the former.

b. *Antilope* (*Cephalophus*) *quadriscopa*, H. Smith, Griffith, A. K. iv. p. 188, v. p. 847; Gray, Cat. Ungul. B. M. p. 77. *Quadriscopa Smithii*, Fitzinger, p. 40. Said to come from Senegal; was probably only a badly observed *Scopophorus*.

8. OREOTRAGUS.

Horns over the orbit, only in males, subulate, elongate, erect. Crumen arched, transverse. Hoofs squarish, high, much contracted and concave beneath. Hair thick, brittle, spreading on all sides. (Gray, Cat. Ungul. B. M. p. 74, t. 9. f. 2, skull.)

1. **Oreotragus saltatrix.** (The Kainsi or Klippspringer.) B.M.

Oreotragus saltatrix, *Gray, Cat. Ungul. B. M.* p. 74, t. 9. f. 2 (skull); *Heuglin, Antil.* p. 9; *Lefeb. Voy. Abys.* t. iv.
Antilope saltatricoides, *Rüppell.*

Hab. South Africa. East Africa: Abyssinia.

Subsection IV. CAPRICORNS.—*Tail short, hairy above, tapering at the end. Horns in both sexes short, strong, conical, recurved, arising on the back edge of the frontal bone behind the orbit. Body heavy; legs and hoofs large. Intermaxillaries scarcely reaching the nasals.*

9. CAPRICORNIS.

Tail short, flattened. Crumen with a large opening. Skull with a deep wide concavity in front of the orbit.

Capricornis, *Gray, Cat. Ungul. B. M.* p. 110, t. 3. f. 1 (skull).

1. **Capricornis sumatrensis.** (The Cambing Outan.) B.M.

Black; chin and linear nuchal mane yellowish.

Capricornis sumatrensis, *Gray, Cat. Ungul. B. M.* p. 110.

Hab. Sumatra.

2. **Capricornis bubalina.** (The ~~Thaar or Thar~~.) B.M.

Grey-brown, blackish-washed; crown and dorsal streak black; thighs and outside of legs rufous.

Capricornis bubalina, *Gray, Cat. Ungul. B. M.* p. 111, t. 13. f. 1 (skull).

Hab. India: Nepal.

3. Capricornis Swinhoei. B.M.

Fur harsh and crisp. Black-brown, with a narrow streak down the back of the neck, a spot on the knee, and the front of the fore legs under the knees black; hind legs bay; sides of the chin pale yellowish, underside of the neck yellow-bay, separated from the upper part of the neck by a ridge of longer hairs. Ears long, brown, pale internally.

Capricornis Swinhoei, *Gray, Ann. & Mag. N. H.* x. 1862, p. 320; *P. Z. S.* 1862, p. 263, t. 35; *Swinhoe, P. Z. S.* 1870, p. 647.

Hab. Formosa, on the Snowy Mountain, or central ridges.

Skull with a deep and wide concavity in front of the orbits, and a keeled ridge on the cheek. Horns short and conical.

4. Capricornis crispa. (The Japanese Goat Antelope.) B.M.

Fur harsh, crisp, brown or brownish; sides whitish; cheeks white; legs black-brown.

Capricornis crispa, *Gray, Cat. Ungul. B. M.* p. 112.

Hab. Japan.

10. UROTRAGUS.

Muzzle moderate. Tail elongate, reaching to the hocks, hairy above, with longer hair at the end. Tear-bag none. Skull (t. 4. f. 8) flattened in front of the orbit. (Gray, Ann. & Mag. N. H. 1871, viii. p. 372.)

1. Urotragus caudatus. B.M.

Antilope crispa, *Radde*, not *Temminck*.
Antilope caudata, *A. Milne-Edwards, An. Sci. Nat.* 1867, vii. p. 377; *Recher. Mam.* pl. 23.

Hab. North China.

Fam. 3. CEPHALOPHIDÆ. (Bush-Bocks.)

Nostrils open, bald within. Nose bovine. Muffle large and moist. Cheek with a longitudinal glandular line in the place of the crumen. Crown crested before the horns. Horns on the hinder edge of the frontal bones, far behind the orbits, conical, angulated at the base, erect or recurved. Body and legs slender, graceful. False hoofs distinct. Tail short, hairy above. Africa.

The forehead of all the *Cephalophi* with decumbent horns is convex and rounded; but in *C. Ogilbyi* it is very much rounded—more

than in any other species I know; it is much higher than the base of the horn. In the species which Dr. Peters has called *C. altifrons* it does not appear to be so high as usual in the genus. In *C. Grimmius*, with ascending horns, it is flat between the eyes. The following observation is founded on the comparison of a series of skulls of males:—The skulls differ in the length of the face, thus:—In *C. natalensis* the face is short; the distance from the orbit to the upper end of the intermaxillary bone is shorter than the length of the intermaxillary bone. In *C. sylvicultrix*, *C. Ogilbyi*, and *C. ocularis* the distance above defined and the length of the intermaxillary are nearly equal. In *C. Grimmius* they are rather longer. In *C. longiceps* the distance from the front edge of the orbit to the tip of the intermaxillary is much longer than the length of the intermaxillary.

Dr. Peters figures as the skull of a young female of *C. altifrons* a skull of a very different form from that of the skull with the horns of the male above referred to. I have not observed such a difference in the skulls of the females of any of the species of *Cephalophus* that have occurred to me. I have some doubt if it does belong to the same species, as the figure of the young female animal is very like the skull of a female *C. Grimmius*, which is an animal that has ascending horns in the male. (Gray, P. Z. S. 1865, p. 204.)

1. GRIMMIA. = Cephalophus

Ears elongate, acute, hairy. Horns elongate, slender, more or less erect or ascending, slanting backwards. Fur yellow or grizzled. Nose often marked with a black streak. Skull conical; forehead flat; nasal bones oblong, elongate; intermaxillary bones elongate.

Cephalophus, sect. **, *Gray, Cat. Ungul. B. M.* p. 78; P. Z. S. 1871, p. 539.

Colour variable, probably influenced by geographical considerations. In the more southern parts the fur is said to become longer and greyer in winter.

* *Horns elongate, suberect. Skull rather short; the intermaxillaries (in three specimens) reaching just up to the edge of the nasals; nasal hole moderate, sides nearly parallel; suborbital pit large, deeply concave.*

1. Grimmia nictitans. (The Duyker or Impoon.) B.M.

Yellowish brown; underside somewhat paler.
Young. Fur longer and softer.

Cephalophus Grimmia, *Gray, Cat. Ungul. B. M.* p. 78.
Cephalophus Grimmius, *Gray, P. Z. S.* 1865, p. 204.

Hab. South Africa. ♂, ♀, and jun. B. M.

2. Grimmia splendidula. (Guinea Duyker.) B.M.

Horns rather bent back, and slightly arched forward at the tip.

Bright reddish grey, white beneath, with a broad black streak up the nose to the base of the horns; tail black above, white beneath.

Cephalophus Grimmia, var. 1, *Gray, Cat. Ungul. B. M.* p. 79.

Hab. West Africa: St. Paul de Loanda (*Gabriel*). Male in B. M.

3. Grimmia irrorata. B.M.

Horns elongate, directed obliquely backwards. Fur yellowish, slightly varied with black tips to the hairs, white beneath; forehead pale bay; nose blackish; tail black above, pale beneath.

Female. Fur much more varied with black rings to the hairs; black streak up the nose. Probably another time of year.

♂ & ♀. Antilope mergens, var. Burchellii, *Sunderall's Pecora*, p. 133.
Cephalopus Campbelliæ (part), *Gray, Cat. Ungul. B. M.* p. 80.
♂. Cephalophus mergens, var. pale, *Gray, Knowsley Menag.*
Antilope ocularis, *Peters, Mossambique*, p. 106, t. 39 (animal), t. 41. f. 1, t. 42. f. 1 (skull).
♀. Antilope altifrons, *Peters, Mossambique*, p. 106, t. 37 (animal), t. 38. f. 2 (skull).
Grimmia irrorata, *Gray, P. Z. S.* 1871, p. 590, f. 1 (skull).

Hab. Natal (*Sundevall*); East Africa, Mozambique, Boror (*Peters*); Lupata (*Kirk*).

Skull in B. M. is like that of *Grimmia nictitans*, but cheek-cavity rather different.

Peters's *Antilope ocularis* (t. 27) very well repesents the male specimen in the British Museum; and the horns of the male are like those on the skull at t. 41. f. 1, and t. 42. f. 1, though we have not a skull of the male to compare with it; but with respect to the intermaxillary bones and the cheek-cavity it is more like the skull of *G. Burchellii*.

The figure of the female *Antilope altifrons* given by Dr. Peters exactly represents our female from Natal, and the skull (t. 28. f. 2) of the female agrees well with the skull of the animal in the British Museum; but the skull figured as the male of this species (t. 28. f. 1) is very different from that of our male animal, and, from the apparent decumbent position and the great narrowness of the nose, it is somewhat more like the skull I described as *C. longifrons* than like that of the true *Grimmia*.

4. Grimmia Campbelliæ. (The Black-faced Philantomba.) B.M.

Horns ——? Grey-and-black grizzled, beneath rather paler; belly and front of thighs white; black streak on the nose, widening on the forehead. Ears elongate, acute.

Cephalophus Campbelliæ, *Gray, Cat. Ungul. B. M.* p. 80.
Antilope Campbellii, *Peters, Mossambique*, p. 186.

Hab. West Africa: Sierra Leone?, Boror (*Peters*). Only a young specimen in the Museum.

** *Horns moderate or short, slanting backwards. Skull rather elongate: nasal hole large, swelling out on the side: the intermaxillaries not reaching the nasals: the suborbital pit very large, rather shallow.*

5. **Grimmia Burchellii.** (Burchell's Bush-Goat.) B.M.

Horns ascending, diverging at the tips. Fur reddish brown, very slightly black-punctulated; face redder; throat, chest, legs, and belly rather greyer brown. The young is darker red.

Cephalophus Burchellii, *Gray, Cat. Ungul. B. M.* p. 81.

Hab. South Africa. Male and jun. in B. M.

6. **Grimmia madoqua.** (The Abyssinian Bush-Goat.) B.M.

Horns slender, recumbent. Yellowish brown, slightly punctulated with black; neck yellowish; limbs blacker. Front of orbit deeply concave. Skull, T. IV. f. 7.

Cephalophus madoqua, *Gray, Cat. Ungul. B. M.* p. 82; *P. Z. S.* 1871, p. 598.

Hab. East Africa: Abyssinia.

2. TERPHONE.

Ears ——? Horns conical, decumbent. Skull elongate; nose compressed; forehead flat; nasals elongate, narrow.

1. Terphone longiceps.

The skull elongate; face elongate, compressed in front of the eyes; the nose in front of the eyes narrow, sides only very slightly tapering; nasal bone very long, produced between the frontal behind, much longer than the median suture of the frontal. The horns elongate, conical, diverging at the tips, decumbent, in a line with the forehead; forehead convex between the orbits. Length of skull 10 inches 9 lines; width at zygoma 4 inches 7 lines; length of horn-cores 5 inches; length of lower jaw 9 inches.

Cephalophus longiceps, *Gray, P. Z. S.* 1865, p. 204 (fig. skull); *Ann. & Mag. Nat. Hist.* 1865, p. 63, f. (skull).

a. M. Barboza du Bocage, in the 'Jorn. de Sciencias da Academia Real de Lisboa,' Aug. 1869, p. 221, describes the head covered with skin of a specimen of *Cephalophus*, which he received from the interior of Angola, the skull of which is exactly like that of *C. longiceps* (P.Z.S. 1863, p. 208). The ears are moderate, rounded at the end, the outer surface covered with very short, close, deep-brown hairs, nearly naked within, except at the edge and end, which is bordered with short whitish hairs; upper surface of the head pale brown; the nose deep brown, and forehead chocolate; the upper part of the cheeks are grey-brown, the lower part and chin whitish. A narrow dark-edged yellow-brown ray above the eyes, and an elongate spot of the same colour under the orbits. The crest is divided into a central

and lateral portions: the central portion is bright red; the lateral ones of hairs of two lengths, the shorter dark brown and the longer bright red. He originally named this species *Cephalophus ruficrista*, but has now changed it to *C. longiceps*.

b. *Antilope altifrons*, Peters, Mossambique, t. 38. f. 1 (skull of male). *Hab*. East Africa: Mozambique. The figure of the skull is very like my *T. longiceps*; but, coming from Madagascar, it may be distinct.

3. POTAMOTRAGUS.

Horns —— ? Forehead crested. Ears rounded, hairy. Back with a vertebral crest of long hair. Rump and buttocks covered with a patch of soft hair. Hoofs triangular. Skull:—forehead convex; nasal bones united into one disk, triangular, broad behind, narrow and acute in front. (P. Z. S. 1871, p. 594, f. 2 & 3, ♀, skull.)

1. Potamotragus melanoprymnus. B.M.

Fur rather long, soft, grizzled by the subterminal white rings on the dark brown hairs; hair of outside of limbs, especially of the middle of the back, longer, scarcely grizzled; rump with a large oval disk of black hair; legs dark brown; ears moderate, hairy.

Cephalophus melanoprymnus, *Gray*, *P. Z. S.* 1871, p. 594, f. 2 & 3 (skull), pl. 44 (animal).

Hab. Gaboon.

This specimen is a very young male, which evidently grows to a large size. The skull with only three grinders, which are of a very large size for the genus. The nasal bones are united, without any appearance of a suture, while all the other sutures of the skull are distinct, forming a triangular disk, which is broad behind and produced into an acute tapering point in front. The frontal bones are convex, but not so prominent and swollen as in older skulls of other species.

Differs from *Cephalophus sylvicultrix* and *niger* in having the very distinct black patch over the base of the tail, and also in the much greater length and softness of the fur. The fur of *C. sylvicultrix* is slightly grizzled.

4. CEPHALOPHUS.

The ears moderate or short, rounded at the end, moderately covered with hair. Horns short and more or less decumbent. Skull short; forehead convex, arched; nasal bones separate, broad behind, narrow and acute in front. (Gray, Cat. Ungul. B. M. p. 82, t. 10. f. 1, skull; P. Z. S. 1865, p. 204, 1871, p. 593, f. 4–8, skulls.)

a. Back with a large yellow stripe. 1. *C. sylvicultrix*.

b. Back with a black dorsal streak. 2. *C. Ogilbyi*; 3. *C. badius*; 4. *C. rufilatus*.

c. Back with a blackish saddle. 5. *C. dorsalis*.

d. Back uniform

* Black. 6. *C. niger.*

** Red. 7. *C. natalensis*; 8. *C. nigrifrons.*

*** Yellow. 9. *C. coronatus*; 10. *C. Whitfieldii.*

**** Blackish grey, with pale streak over eye. 11. *C. pygmæus*; 12. *C. Maxwellii*; 13. *C. melanorheus.*

***** Brown, punctulated. 14. *C. punctulatus*; 15. *C. bicolor.*

1. **Cephalophus sylvicultrix.** (White-backed Bush-Goat.) B.M.

Ears moderate, rounded. Fur greyish brown, grizzled with black, with a narrow white central streak behind.

Cephalophus sylvicultrix, *Gray, Cat. Ungul. B. M.* p. 83; *P. Z. S.* 1871, p. 595, fig. 4 (skull).

Hab. West Africa: Sierra Leone. Skull in B. M.

Skull short, ventricose; face short; nose, between the concavities of the suborbital glands, broad and tapering; forehead convex and rounded. Length 10 inches 1 line; width at the zygoma 4 inches 7 lines; length of lower jaw $8\frac{3}{4}$ inches.

2. **Cephalophus Ogilbii.** (The Black-striped Bush-Buck.) B.M.

Horns thick, elongate, conical, very rugose on the inner front edge of the base. Skull, forehead very convex. Pale bay-brown, with a deep-black dorsal streak; beneath paler.

Cephalophus Ogilbii, *Gray, Cat. Ungul. B. M.* p. 83.

Hab. Fernando Po. Skull in B. M.

Var. Bright bay; dorsal streak rather wider.

Hab. Gaboon. Male in British Museum.

The hair of the cheeks, chin, neck, and chest short; of back longer, rigid; of underside of body long, soft.

3. **Cephalophus badius.** (The Bay Bush-Buck.) B.M.

Bright bay, with a well-defined broad dorsal streak. Horns conical, rugose, rather elongate.

Cephalophus badius, *Gray, Cat. Ungul. B. M.* p. 84; *Murie, P. Z. S.* 1869, p. 995.

Cephalophus breviceps, *Gray, P. Z. S.* 1866, p. 203, t. 11; *Selater, P. Z. S.* 1869, p. 594 (young female).

Hab. West Africa: Sierra Leone.

The young female described as *C. breviceps* became like the typical *C. badius.*

4. **Cephalophus rufilatus.** (The Coquetoon.) B.M.

The horns conical, obscurely annulated. Deep reddish bay; the crown and broad streak of back blackish grey.

Cephalophus rufilatus, *Gray, Cat. Ungul. B. M.* p. 85; *P. Z. S.* 1871, p. 597 (fig. 5, skull).

Hab. West Africa: Sierra Leone and Gambia.

5. **Cephalophus dorsalis.** (The Bay Bush-Goat.) B.M.

Horns very short. Dark bay, with a broad, indistinctly defined, dorsal saddle.

Cephalophus dorsalis, *Gray, Cat. Ungul. B. M.* p. 84; *Temminck, Esquis.*; *Sclater, P. Z. S.* 1869, t. 46.

Hab. West Africa: Sierra Leone; Ashantee (*Temminck*); Gold Coast (*Mosse*). Evidently a large species.

6. **Cephalophus niger.** (The Black Bush-Buck.) B.M.

Horns short, decumbent. Sooty black, greyer in front half of body; chin and beneath grey.

Cephalophus niger, *Gray, Cat. Ungul. B. M.* p. 84; *P. Z. S.* 1871, p. 597.

Hab. West Africa: Guinea.

7. **Cephalophus natalensis.** (A. Smith) B.M.
(The Natal Bush-Buck, or Rhoode Bock.)

Horns short, conical, decumbent, bent back, strongly angulated at the base. Bright red bay.

Cephalophus natalensis, *Gray, Cat. Ungul. B. M.* p. 85, t. 10. f. 1 (skull).

Hab. South Africa, Natal. Skull in B. M.

8. **Cephalophus nigrifrons.** (Black-fronted Bock.) B.M.

Head, neck, and body, above and below, covered with long, rigid, bright bay hairs; nose, forehead, and crown between the horns with rigid black hairs, and a few black hairs interspersed on the nape and shoulders; outside of fore legs blackish. Hoofs narrow, rather elongate.

Cephalophus nigrifrons, *Gray, P. Z. S.* 1871, p. 598, f. 6 (skull), pl. 46 (animal).

Hab. Gaboon.

Like *C. badius*, but has no dorsal streak. Differs from *C. natalensis* in the black forehead and tail, and dark fore legs, and the hair is much more rigid.

Skull:—length 7 inches, height at occiput $2\frac{5}{8}$, width at back of orbit $2\frac{5}{8}$; nasal bones very sharp in front and broad behind; cheek-cavities very large and deep, and separated from the orbit by a very slender septum.

9. **Cephalophus coronatus.** (The Coquetoon.) B.M.

Horns short and conical; ears rather acute. Pale yellowish brown; middle of the back and fore legs varied with a few black hairs.

Cephalophus coronatus, *Gray, Cat. Ungul. B. M.* p. 82; *P. Z. S.* 1871, p. 599 (fig. 7, skull).

Hab. West Africa. Skull.

10. **Cephalophus Whitfieldii.** (The White-footed Guevei.) B.M.

Yellowish ash; hair ashy grey, of the back brown at the ends, with a yellow tip; orbits and ring above the hoof ashy white.

Cephalophus Whitfieldii, *Gray, Cat. Ungul. B. M.* p. 88.

Hab. West Africa: Gambia. A very young animal.

11. **Cephalophus pygmæus.** B.M.
(The Noumetzi, or Cape Guevei.)

Fur soft, grey, intermixed with a few black hairs; streak over the eyes, legs, and thighs grey-rufous.

Cephalophus pygmæa, *Gray, Cat. Ungul. B. M.* p. 87.
Antilope pygmæa, *Peters, Mossambique*, p. 184.

Hab. South Africa: Mozambique (*Peters*).

Mr. Kirk says that this species differs from the Cape one in the female having horns; but many female Bush-Goats have them in a rudimentary state.

12. **Cephalophus Maxwellii.** (The Guevei.) B.M.

Grey-brown; fur rather rigid, uniform. Horns conical, rather elongate, annulated at the base.

Cephalophus Maxwellii, *Gray, Cat. Ungul. B. M.* p. 86; *P. Z. S.* 1871, p. 600 (fig. 8, skull).

Hab. West Africa: Senegal and Gambia.

13. **Cephalophus melanorheus.** (The Black-rumped Guevei.) B.M.

Fur soft, pale grey, with intermixed rigid grey hairs; grey-brown; rump and upper part of tail black.

Cephalophus melanorheus, *Gray, Cat. Ungul. B. M.* p. 88.

Hab. West Africa: Fernando Po (*Thomson*).

Var. Darker, more like *C. pygmæus*, but with black rump.

Hab. Gaboon. Male in British Museum without sheath to horns.

14. **Cephalophus punctulatus.** (The Grizzled Guevei.) B.M.

Horns ——? Fur dark fulvous brown; hair grey at the base, with brown ends, and with yellow subterminal rings; narrow streak over the eye pale brown.

Cephalophus punctulatus, *Gray, Cat. Ungul. B. M.* p. 88.

Hab. West Africa: Sierra Leone (*Sabine*).

15. **Cephalophus bicolor.** B.M.

Fur soft, brown, with the rump, the whole of the hind legs, the chin, throat, chest, belly, the inner side of the fore legs, a broad ring over the fore hoofs, and a large spot occupying the front of the face and forehead pure white. The ears blackish, white within; the sides of the forehead darker brown.

Caphalophus bicolor, *Gray, P. Z. S.* 1862, p. 263, t. 34; *Ann. & Mag. N. H.* 1862, vol. x. p. 400.

Hab. South and East Africa: Zulu Land (*Fossbrook*).

Probably the white is an accidental variation. The brown fur is very like that of *punctulatus*, but rather brighter; and it is found in a very different locality.

Fam. 4. PELEADÆ.

Nostrils open, bald within (?). Face narrow, elongate. Nose swollen, soft, bovine. Muffle large, extending far behind the nostrils. Crumen none. Horns over the orbits, conical, slender, erect, cylindrical at the base, scarcely diverging, and bent forward at the tip. False hoofs distinct, large. Inguinal pore distinct; teats four. Body light and elegant. Legs slender. Fur woolly. Tail small and bushy. Intermaxillaries not reaching the nasals. Lower jaw very slender and weak. Skull, T. III. f. 5. Africa.

1. PELEA.

Pelea, *Gray, Cat. Ungul. B. M.* p. 90, t. 36. f. 2, 3, 4.

1. **Pelea capreola.** (The Rehbock or Peele.) B.M.

Pelea capreola, *Gray, Cat. Ungul. B. M.* p. 90, t. 36. f. 2, 3, 4 (skull).
Tragelaphus capreola, *Rüppell.*

Hab. South Africa.

Fam. 5. NESOTRAGIDÆ.

Nose bovine. Muffle large. Nostrils open, bald within. Horns only in male, conical, cylindrical, ringed at the base. Crumen distinct, or very small. Face and forehead not crested. Body and legs slender, elegant. Hoofs small, triangular. False hoofs none. The underside of the pasterns covered with close, short, rigid black hairs.

* *Opening of crumen very small. Horns short.*

1. NANOTRAGUS.

Horns very short and conical. Ears small, rounded. Tear-bag none. Legs slender. Tail moderate, subpectinate. Hoofs small, triangular. False hoofs none. Nose bovine. Muffle large and moist. (Gray, Cat. Ungul. B. M. p. 89, t. 10. f. 2, head.)

1. Nanotragus perpusillus. (The Royal Antelope.) B.M.

Nanotragus perpusillus, *Gray, Cat. Ungul. B. M.* p. 89, t. 10. f. 2 (head).

Hab. West Africa, Guinea.

** *Opening of crumen large. Horns elongate, erect.*

2. NESOTRAGUS.

Horns over the orbits, only in males, nearly straight, elongate, strong, many-ridged, slanting backwards. Nose bovine. Muffle large. Crumen large and deeply arched. Ears large. Tail very short. Scrotum very large. Skull short, with an extremely large and deep hemispherical concavity before the orbits. Nose-hole moderate; intermaxillaries elongate to the nasals; nasals very long, extending beyond the front edge of the orbit. T. V. (Gray, Cat. Ungul. B. M. p. 75.)

1. Nesotragus moschatus. B.M.

Reddish grey; belly white; legs pale reddish; hair of back brown, reddish above the middle, with an obscure pale dot and blackish tip.

Nesotragus moschatus, *Gray, Cat. Ungul. B. M.* p. 75.
Cephalophus zanzibaricus, *Layard, Cat. Mam. S.-African Mus.* 1861, p. 72.

Hab. E. Africa: Zanzibar (*Speke*).

2. **Nesotragus Livingstonianus.** (Runiza or Lurusa.) B.M.

Brown, middle of nose black.

Nesotragus moschata, *Peters, Mossamb.* p. 189.
Nesotragus Livingstonianus, *Kirk, P. Z. S.* 1864, p. 637.

Hab. Central Africa: Shupanga and Lupata (*Kirk*). In dense underwood jungle, in pairs.

"Same size as the Zanzibar species; but the Zambesi species is lighter, the hair softer, the ears larger and broader, the horns more closely ringed, and the nostrils more narrowed."—*Kirk.*

3. PEDIOTRAGUS. (The Bleek-Bock.)

Horns over the orbit, only in males, subulate, elongate, erect over the back of the orbit. Nose bovine; muffle large; crumen arched, transverse. Ears large. Tail very short. Hoofs triangular, flat beneath and acute in front. Inguinal pores none. Scrotum large. Intermaxillary bones reaching to the nasal. (*Calotragus*, sect. 1, Gray, Cat. Ungul. B. M. p. 71, t. 8. f. 4, 5, skull.)

1. **Pediotragus campestris.** B.M.
(The Stein-Bock, or Bleek-Bock.)

Fulvous ash; hair uniform, often white-tipped.

Calotragus campestris, *Gray, Cat. Ungul. B. M.* p. 71, t. 8. f. 4, 5, *as* C. tragulus.
Antilope tragulus, *Peters, Mossamb.* p. 187.

Hab. South Africa.

** *Nose ovine, covered with hair, without any or only a rudimentary muffle.*

Fam. 6. OVIBOVIDÆ.

Nostrils open, bald within. Nose ovine, hairy, with a small naked muffle. Horns behind the orbits, round, smooth, close together at the base, spread out on the sides, conical, depressed and rugose at the base. Tail very short, flattened, hairy above. False hoofs well developed. Skull: nose-hole large; intermaxillaries short, not reaching the nasals; no suborbital fissure or fossa; molars well developed with supplementary lobe.

1. OVIBOS.

Nose ovine, hairy; inner edge of the nostril with a bald margin. Horns of the male very broad at the base, nearly united together,

tapering, pressed downwards against the sides of the head, and bent up at the tips; of the female subcylindrical, curved, far apart on the sides of the forehead. Tail rudimentary, very short, entirely hidden by the fur of the haunches. Hoofs broad, apices reflexed. (Gray, Cat. Ungul. B. M. p. 43, t. 5. f. 1–4, and t. 6, skulls of males and females.)

1. **Ovibos moschatus.** (The Musk-Ox.) B.M.

Ovibos moschatus, *Gray, Cat. Ungul. B. M.* p. 43, t. 5. f. 1, 2 (skull, male), t. 6; *Baird, Mamm. North Amer.* p. 631, f.

Hab. North America. The barren lands in lat. 60° north.

2. BUDORCAS.

Muzzle hairy, with a small naked muffle edging the nostrils. Ears narrow, pointed. The fur (in summer, at least) consists of short, harsh, adpressed hair. The tail is short, very depressed and hairy, like the tail of a goat. The head is large and heavy. The lips taper, and are clad with hair, like sheep. The nostrils are wide and terminal. The horns are round, smooth, lunate; they are nearly in contact on the top of the head; their direction is vertically upwards, then horizontally outwards or to the sides, and then almost as horizontally backwards. The limbs short and straight; the hoofs broad. Intermaxillaries moderate, not reaching the nasals. Nasals very high up the hinder edge, level with the orbits. (Gray, Cat. Ungul. B. M. p. 44, t. 5. f. 3, 4, skull.)

1. **Budorcas taxicola.** (The Takin.) B.M.

Budorcas taxicola, *Gray, Cat. Ungul. B. M.* p. 45, t. 5. f. 3, 4 (skull); *P. Z. S.* 1853, pl. 36; *Anderson, P. Z. S.* 1869, p. 470.

Hab. Eastern Himalaya. Lives among the snow, seldom seen below it. In pairs, or small herds of twenty or more (*Anderson*).

Fam. 7. SAIGADÆ.

Nostrils open, bald within, placed on the side of the high, compressed, truncated, hairy nose. Crumen distinct. Horns over the orbits, lyrate, annulated, pale yellow. Fur very thick. Tail short. False hoofs well developed. Skull: nose-hole very large, reaching to nearly the orbits; intermaxillaries short; no lachrymal fissure, and a shallow impressed suborbital fossa; molars without additional lobe. Asia.

1. SAÏGA.

Saïga, *Gray, Cat. Ungul. B. M.* p. 51, t. 6. f. 1, 2 (skull and horns); *Murie, P. Z. S.* 1870, p. 503, figs.
Colus siag, *Fitzinger.*

1. **Saïga tartarica.** (The Colus or Saïga.) B.M.

Pale yellowish; crown and back greyish-washed. Young, crown greyer.

Saïga tartarica, *Gray, Cat. Ungul. B. M.* p. 51, t. 6. f. 1, 2 (skull); *Sclater, P. Z. S.* 1867, t. 17 (animal); *Murie, P. Z. S.* 1870, p. 451.

Hab. Siberia.

Fam. 8. PANTHOLOPIDÆ.

Nostrils bald within; nose conical, subovine, of the males with a large dilatation on the outer side of each nostril. Crumen distinct. Horns over the orbits, only in males, elongate, compressed, lyrate, annulated at the base. False hoofs well developed. Skull: nose-aperture large; intermaxillary bones rather short; rest like *Saïga*.—Asia.

1. PANTHOLOPS.

Pantholops, *Gray, Cat. Ungul. B. M.* p. 52, t. 6. f. 3, 4 (skull and horns).

1. **Pantholops Hodgsonii.** (The Chiru.) B.M.

Pale brown; chest and inner side of the limbs white; front of face and front of fore legs blackish.

Pantholops Hodgsonii, *Gray, Cat. Ungul. B. M.* p. 53, t. 6. f. 3, 4 (skull).

Hab. Thibet. Open plains.

Fam. 9. ANTILOPIDÆ. (Antelopes.)

Nostrils open, bald within; nose ovine, narrow, simple. Crumen distinct, rarely very small. Horns in males and females, conical or compressed, ringed at the base. False hoofs well developed. Skull: nose-aperture moderate; intermaxillaries generally reaching to the nasals, rarely shorter.

Antilopeæ veræ, *Gray, Cat. Ungul. B. M.* p. 50.

Subsection I. Oryxes.—*Horns over the orbit, or rather behind, in both sexes, elongate, straight, recurved, subspiral. Tail bovine, elongate, cylindrical, end tufted. Body large and heavy. Tear-bag none, or only marked with a tuft of hair. Skull with small suborbital fissure and no fossa: molar with supplementary lobes.*

a. *Nape with an erect recurved mane.*

1. ÆGOCERUS.

Horns over the orbit, moderate, recurved, ringed, rather compressed at the base. (Gray, Cat. Ungul. B. M. p. 102, t. 12. f. 1, 2, as *Hippotragus*?)

1. **Ægocerus leucophæus.** (The Etaac, or Blaubock.) B.M.

Glaucous grey.

Ægocerus leucophæus, *Gray, Cat. Ungul. B. M.* p. 102, t. 12. f. 1, 2, *as* Hippotragus leucophæus (female).

Hab. South Africa; East Africa, Kazeh (*Speke*). In swampy ground.

2. **Ægocerus Bakeri.**

"Pale fulvous liver-colour. Forehead with ocular spot and with three or four scarcely oblique spots black. Nose white. Mane of neck and back long, very deep black. Horns in both sexes strong, rounded at the base, close together, arched and recurved, and annulated nearly to the tips."—*Heuglin.*

Hippotragus Bakeri, *Heuglin, Antilopen,* p. 16, t. 2. f. 4 (horns); *Sclater, P. Z. S.* 1868, p. 214, t. 16 (young), pp. 216, 217, f. (horns).

Hab. North-east Africa.

"Sir Samuel Baker has also favoured me with the loan of a leaf from his original note-book, containing a pencil-sketch of the adult male of this species. The elongated mane and the shoulder-stripes are clearly marked in this sketch.

"A pair of horns, the original specimens figured by Heuglin, are figured [P. Z. S. 1868, pp. 216, 217, figs. 6*a* and 6*b*]. They measure 27 inches in length along the upper surface from the base to the tip, and are regularly annulated up to about 6 inches from the tip, the annulations being about 27 or 28 in number. Upon comparing them with horns of *Hippotragus equinus* in the British Museum and the collection of the Royal College of Surgeons, I find the differences, as might have been expected, very small. But, judging from the single pair before us, the horns of the northern species appear to be much more massive, especially at the base, and not quite so long, and to have the tips *diverging* instead of slightly converging. This latter character may perhaps vary in individuals.

"As regards the general external appearance of Baker's Antelope, it would seem to be readily distinguishable from the Equine Antelope by the pale fulvous colour, the pencilled ears, and the black stripes over the shoulders, which, although not distinguishable in the young

specimen now at Turin, are, as is shown in Sir Samuel Baker's sketch, well marked in the adult."—*Sclater*.

There is a young male Antelope, lately received from Dr. Ori, figured from a coloured photograph, P. Z. S. 1868, t. 16.

3. **Ægocerus koba.** (The Docoi.) B.M.

Pale reddish brown. The hair pale at the base, with a minute pale tip; front of fore legs and line on centre of tail blackish; belly and inside of legs white; face black-brown, crown and temple browner; nose, lips, eyebrows, and tuft of hair before eyes white.

Ægocerus leucophæus, var. docoi, *Gray, Cat. Ungul. B. M* p. 103.]

Hab. West Africa: Gambia.

4. **Ægocerus niger.** (The Tapetse, or Para-Para.) B.M.

Black or brown; face white, with a dark streak. Female and young brown.

Ægocerus niger, *Gray, Cat. Ungul. B. M.* p. 104.
Hippotragus niger, *Heuglin, Antilopen*, p. 16.

Hab. South Africa; East Africa, Kazeh (*Speke*).

Var. *Kirkii*. Entirely tawny-coloured, with the face marked like the Sable Antelope. Forming herds, without any black specimens being intermixed.

a. *Ægocerus pictus*, Erhard, Fauna der Cyklader, p. 29. *Hab.* Antimelos.

2. ORYX.

Horns behind the orbit, elongate, subulate, ringed at the base, straight or slightly arched, placed in a line with the face. Neck maned above and below. Edge of the nostrils naked. Tear-bag none. (Gray, Cat. Ungul. B. M. p. 105, t. 12. f. 3, 4.)

1. **Oryx gazella.** (The Kookaam, or Gemsbock.) B.M.

Horns straight, shelving backwards; throat with a bunch of black hairs.

Oryx gazella, *Gray, Cat. Ungul. B. M.* p. 105, t. 12. f. 3, 4 (skull, as *Oryx leucoryx*).

Hab. South Africa.

2. **Oryx beisa.** (The Beisa.) B.M.

Horns straight; throat without any bunch of hair.

Oryx beisa, *Gray, Cat. Ungul. B. M.* p. 106; *Heuglin, Antilopen*, p. 16.

Hab. Abyssinia.

3. **Oryx leucoryx.** (The Oryx.) B.M.

Horns slender, slightly arched. Fur white, reddish-varied, in winter grey.

Oryx leucoryx, *Gray, Cat. Ungul. B. M.* p. 107; *Wolf's Zool. Sketches*, tab. xxiii.
Oryx ensicornis, *Heuglin, Antilopen*, p. 17.

Hab. North Africa, Nubia; East Africa, Sennaar; West Africa, Senegal.

4. **Oryx beatrix.** (The Beatrice.) B.M.

The horns slender, straight, or only very slightly curved near the tip, annulated nearly to the tip. White; a spot on the middle of the face, a smaller spot between the base of the horns, a large patch on each cheek, extended above up to the eyes, and united together beneath under the throat, the knees and front of the fore and hind legs, and a large spot on the chest dark blackish brown; legs to the posterior grey-brown; end of the tail black.

Oryx beatrix, *Gray, P. Z. S.* 1857, p. 157, t. 55; *Ann. & Mag. N. H.* 1857, vol. xx. p. 466.

Hab. Bombay, but probably brought from the shores of the Red Sea.

This specimen is not half the size of the Gemsbock from the Cape, and is immediately known from it by the distribution of its colours.

In form and size it resembles the true *Oryx* (*O. leucoryx*); but it differs in the straightness of the horn, the size and form of the cheek-spot and especially in the dark colour of the legs, and the well-marked white ring around the fetlock-joint, just above the hoof.

The hair is whorled on the middle of the haunches, as in the rest of the genus, and the hairs of the back in front of the withers are directed forwards.

The animal is intermediate between these species: it has the straight horn of *O. gazella* and the plain colour of *O. leucoryx*; but its dark legs and peculiar white feet at once separate it from either.

The animal was presented to the Society by Capt. John Shepherd, of the India House. It was regarded in the gardens as a half-grown *Oryx gazella*, and is said to have been brought from Bombay. A pair was shipped from the latter port; but the female died at sea. The male is now in the collection of the British Museum.

b. *Throat slightly maned; nape not maned.*

3. ADDAX.

Horns behind the orbit, slender, elongate, ringed, slightly twisted, sloping in a line with the face. Hoofs semicircular, thin-edged. (Gray, Cat. Ungul. B. M. p. 108, t. 12. f. 5, skull.)

1. **Addax nasomaculata.** (The Addax.) B.M.

White; forehead and front of face darker; in winter grey.

Addax nasomaculatd, *Gray, Cat. Ungul. B. M.* p. 108, t. 12. f. 5 (head); *Heuglin, Antilopen*, p. 18.

Hab. North Africa.

Subsection II. GAZELLES.—*Tail moderate, compressed, hairy on the upper side from the base. Legs slender, and body graceful. Horns over the orbit, lyrate or subspiral, compressed. Suborbital fissure distinct; fossa moderate; molar without supplementary lobe.*

4. PROCAPRA.

Nose simple, ovine. Crumen very small, almost covered with hair. Horns moderate, lyrate, subcylindrical, tips bent upwards. Nose-hole of skull large. Intermaxillary bones short. (Gray, Cat. Ungul. B. M. p. 54.)

Fur soft and dense. Face hairy. Flesh excellent.

"A follicle, like the musk-bag in *Moschus*, in front of the prepuce."—*Pallas*.

1. Procapra gutturosa. (Hwang Yang.) B.M.

Pale yellowish. Hair long, soft. Horns straight, cylindrical, bent upwards.

Procapra gutturosa, *Gray, Cat. Ungul. B. M.* p. 54.
The Yellow Sheep of Mongolia (Procapra gutturosa), *Gray, P. Z. S.* 1867, p. 245, fig. 1 (skull and horns).

Hab. Thibet.

The "Yellow Sheep," of which Dr. Lockhart has sent two skulls to the British Museum, was described by Pallas under the name of *Antilope gutturosa* (Spic. Zool. vii. 14, t. 2, 3. f. 14–17). The horns are like those of *Gazella dorcas*, but rather longer, and with more numerous and closer rings.

The "Yellow Sheep of Mongolia" (*Procapra gutturosa*) is known from the nearly allied "Goa" of Tibet (*Procapra picticauda* of Hodgson) by its larger size and the shortness and thickness of the horns, which have their tips turned upwards. The two species agree in the length, softness, and colour of the fur, and in having a distinct white rump-spot. The horns of the Goa are much more slender, compressed, and longer than those of the Yellow Sheep, and have the tips bent rather forwards. The length of the horn, along the curves, of the adult Yellow Sheep is $9\frac{1}{2}$ inches, of the Goa $11\frac{1}{2}$ inches. The latter has about twenty-four or twenty-five, and the former only twenty rings. There are also several differences in the skulls. The aperture of the front blood-vessels at the base of the horn in *P. gutturosa* is very much larger than that in *P. picticauda*. Pallas describes the horns of *P. gutturosa* as "*lutescenti-opaca*;" but in the two specimens in the British Museum they are of a dark blackish horn-colour, in this respect very different from those of the "Goa." (Gray, P. Z. S. 1867, p. 246.)

"The horns I took to the Museum yesterday I brought with me from Pekin. The animal to which they belong is called *Hwang-*

Yang, the Yellow or Imperial Sheep. It is brought into Peking from Mongolia in large numbers in a frozen state, and sold for food. The flesh is much esteemed for its fine flavour and tenderness, and is eagerly purchased both by natives and foreigners.

"The European gentlemen in Peking used to go into Mongolia on shooting-expeditions, for the purpose of hunting the *Hwang-Yang*. The animal, however, is very wary, and generally keeps a long way out of range, so that the hunters are not very successful. It is considered a great feat to kill one of them."—*W. Lockhart.*

2. **Procapra picticauda.** (The Ragoa or Goa.) B.M.

Hair pale brown; inside of the ears and limbs and anal disk white; tail black; horns slender, elongated, compressed, closely ringed, tip bent forward.

Procapra picticauda, *Gray, Cat. Ungul. B. M.* p. 55 (not t. 7. f. 1); *P. Z. S.* 1867, p. 246, f. 2 (skull and horns).

Hab. Thibet.

5. GAZELLA.

The crumen distinct. Fur short, close-pressed. Back simple. Horns moderate, lyrate. (Gray, Cat. Ungul. B. M. p. 55, t. 6. f. 5, skull.)

* *Knee with tufts; back and rump brown, vent white. Lower part of the sides with a dark oblique streak; feet with a tuft of black hair.* Gazella.

† 1. **Gazella dorcas.** (The Gazelle.) B.M.

Fur rather long and harsh, grey-brown.

Gazella dorcas, *Gray, Cat. Ungul. B. M.* p. 55, t. 6, f. 6 (skull of female).

Hab. North Africa and India?; Palestine; Persia; Asia Minor.

† 2. **Gazella Isabella.** (The Isabella Gazelle.) B.M.

Fur short, very soft, pale yellowish brown, with a broad, rather paler oblique streak on the upper part of the side.

Gazella Isabella, *Gray, Cat. Ungul. B. M.* p. 57.
Gazella Isidis, *Sundevall.*

Hab. North Africa and Abyssinia; Morocco, Algiers, and Tripoli.

3. **Gazella subgutturosa.** (The Jairou.) B.M.

Pale brown, sides browner; upper part of sides with a broad, rather paler streak; crown and knee-tuft greyer. Horns large; nose-hole of skull rather large.

Gazella subgutturosa, *Gray, Cat. Ungul. B. M.* p. 58; *Wolf's Zool. Sketches*, tab. xxii.

Hab. North Persia, between Caspian and Black Seas; Siberia.

** *Knee without tufts; side-streak none; rump and throat with a white spot; tail slender, compressed, only hairy above.* Dama, *Bennett.*

4. **Gazella Sœmmeringii.** (The Abyssinian Mohr.) B.M.

Pale brown; nose, forehead, lower edge of face-streak, and end of tail blackish; chest, belly, angular mark on rump above tail, face-streak, and spot on throat white; limbs pale. Female, forehead paler in centre.

Gazella Sœmmeringii, *Gray, Cat. Ungul. B. M.* p. 59; *Sclater, P. Z. S.* 1867, pl. 37.

Hab. Lower Abyssinia.

5. **Gazella mohr.** (The Mohr.) B.M.

Bay; chin, spot on throat, chest, belly, edge and inside of limbs, and angular spot on rump above the tail white; spot on side of face and end of tail black.

Gazella mohr, *Gray, Cat. Ungul. B. M.* p. 59.

Hab. West Africa, Gambia, and Senegal.

6. **Gazella ruficollis.** (The Andra.) B.M.

Whitish; neck and front part of the middle of the back reddish; face-streak none.

Gazella ruficollis, *Gray, Cat. Ungul. B. M.* p. 60.

Hab. Kordofan and Senaar.

*** *Knees without tufts, but with rather longer hair, forming a linear keel in front; back and rump brown; sides with dark streak.*—Korin.

7. **Gazella rufifrons.** (The Korin.) B.M.

Bay-brown; sides above paler, with a broad dark streak below; chest, belly, inside of legs, back edge of tarsus, and underside of feet and anal disk white; face bright bay, with a broad white side-streak.

Eudorcas, *Fitzinger*, p. 32.
Gazella rufifrons, *Gray, Cat. Ungul. B. M.* p. 60.

Hab. West Africa, Senegal and Gambia; East Africa, Senaar.

6. TRAGOPS.

Horns lyrate, elongate, compressed, closely ringed. Crumen small. Fur short, adpressed, without any dorsal streak. Knees tufted. India. (Gray, Cat. Ungul. B. M. p. 61, tab. 7. fig. 1, skull.)

1. **Tragops Bennettii.** (The Chickara or Ravine-Deer.) B.M.

Bay-brown; knee-tuft, end of nose, and tail black; streak on

Gazella wallerii, Brooke, P. Z. S. 1878. 929
Sclater ibid. 1884, 539
b. Africa.

haunches blackish; face-streak, chest, belly, and inner side of limbs white; feet black or brown.

Tragops Bennettii, *Gray, Cat. Ungul. B. M.* p. 62, t. 7. f. 1 (head), t. 7. f. 2 (skull).
Tragopsis Bennettii, *Fitzinger*, p. 30.

Hab. India: Madras, Nepaul.

7. ANTIDORCAS.

Horns lyrate, short, black, strong. Crumen moderate, distinct. Hair close-pressed. Back with an expansile fold and streak. (Gray, Cat. Ungul. B. M. p. 63.)

1. **Antidorcas euchore.** (The Tsebe or Spring-Bock.) B.M.

Pale brown; face, throat, chest, belly, broad expansile streak on back to base of tail, edge and inside of limbs white.

Antidorcas euchore, *Gray, Cat. Ungul. B. M.* p. 63.

Hab. South Africa. Migratory.

8. ANTILOPE.

Horns elongate, subspiral, diverging. Crumen large. Skull—suborbital fossa large. (Gray, Cat. Ungul. B. M. p. 66, t. 8. f. 1, 2, 3, skull.)

1. **Antilope bezoartica.** (The Antelope or Sasin.) B.M.

Antilope bezoartica, *Gray, Cat. Ungul. B. M.* p. 66.
Antilope cervicapra, *Gray, Cat. Ungul. B. M.* t. 8. f. 1, 2, 3 (skull and horns).

Hab. India, plains.

Subsection III. MADOKA.—*Tail very short, hairy above. Horns on the hinder edge of the frontal bones, far behind the orbits, in male only, short, conical, recumbent. Crumen large; crown crested.*

9. NEOTRAGUS.

Skull, nose-hole very large; intermaxillaries long, very slender, dilated at the upper end; nasal bones very short, broad, notched on each side in front. (Gray, Cat. Ungul. B. M. p. 76, t. 9. f. 3, head, t. 1. f. 2, skull.)

1. **Neotragus Saltiana.** (The Madoqua.) B.M.

Neotragus Saltiana, *Gray, Cat. Ungul. B. M.* p. 76, t. 9. f. 3.
Calotragus nigripes, *Gray, P. Z. S.* 1861.

Hab. Abyssinia, Kordofan.

N. hirki. Günther, S. Somali-Land. P. Z. S. 1880, p. 17
N. damarensis, Günther. Damara. l. c.

Subsection IV. CAPRINE ANTELOPES.—*Tail moderate, hairy above. Horns short, conical, inclined, recurved, arising behind the orbits. Crumen very small. Intermaxillary bone short. Body heavy. Legs strong, thick; hoofs large. Skull—no suborbital fissure; a round shallow fossa; molars without supplementary lobe.*

10. NEMORHEDUS. (Gorals.)

Horns on the back edge of the frontal bones behind the orbits, short, conical, recurved. Crumen distinct. Tear-pit deep concave. (Gray, Cat. Ungul. B. M. p. 112, t. 13. f. 1, 2, skull.)

1. **Nemorhedus goral.** (The Goral.) B.M.

Nemorhedus goral, *Gray, Cat. Ungul. B. M.* p. 112, t. 13. f. 2 (skull).

Hab. Nepaul.

11. MAZAMA.

Horns rather behind the eye, short, thick, conical, recurved. Crumen none. Fur very long, hair dependent; under-fur short and woolly. (Gray, Cat. Ungul. B. M. p. 114, t. 14. f. 1, head.)

Haploceros, *Wagner.*

1. **Mazama americana.** (The Mazame or Mountain-Goat.) B.M.

White; horns and edge of the nostrils black.

Mazama americana, *Gray, Cat. Ungul. B. M.* p. 114, t. 14. f. 1 (head); *Baird, Mam. N. Amer.* p. 671.

Hab. North America: Rocky Mountains.

12. RUPICAPRA.

Horns over back part of orbit, elongate, slender, round, nearly erect, suddenly hooked backward at the tip; intermaxillary bones not reaching the nasals. (Gray, Cat. Ungul. B. M. p. 115, t. 14. f. 3, 4, skull.)

1. **Rupicapra tragus.** (The Chamois or Gemse.) B.M.

Yellowish brown, with a dark dorsal streak, in winter blackish.

Rupicapra tragus, *Gray, Cat. Ungul. B. M.* p. 115, t. 14. f. 3, 4.

Hab. European Alps.

Hybrid with female Goat. (Blyth, P. Z. S. 1869, p. 135, fig. horns.)

Fam. 10. ÆPYCEROTIDÆ.

Horns over the orbit, conical, compressed, ringed at the base. Nose tapering, ovine, simple. Crumen none. False hoofs none. Pastern with tufts of rigid black hairs on each side.

1. ÆPYCEROS.

Horns lyrate, elongate, wide-spreading, curved outwards at the base, then upwards at the tips. Crumen none. Knees not tufted, with a tuft of black hair near the pasterns. (Gray, Cat. Ungul. B. M. p. 64, t. 7. f. 3, head and horns.)

1. **Æpyceros melampus.** (Pallah or Rooge Bock.) B.M.

Bay; sides and knee paler, tuft above the back of feet black.

Æpyceros melampus, *Gray, Cat. Ungul. B. M.* p. 65, t. 7. f. 3 (head and horns).

Hab. South Africa. Migratory. Uzaramo (*Speke*). Open parts of the forest in herds.

B. *Nostrils covered with a valve, hairy within. Crumen none.*—Antilopeæ desertorum, *Gray, Cat. Ungul. B. M.* p. 118.

Fam. 11. CONNOCHETIDÆ. (Gnoos.)

Muzzle very depressed, spongy and bristly. Nostrils far apart, covered with a valve, bearded within. Horns on the hinder part of the frontal bones, behind the orbit, conical, cylindrical, close together at the base, and bent outwards and recurved at the tips. Body stout; legs very slender. Tail elongate, equine, covered with long hair from the base. Teats four. Hoofs much compressed in front; false hoofs well developed. Skull without orbital fissure; intermaxillary reaching to the nasal.—Africa.

Equine Antelopes (Antilopeæ equinæ), *Gray, Cat. Ungul. B.M.* p. 119.
Connochetes, *Gray, Cat. Ungul. B. M.* p. 119.

The horns of the young Gnu are erect, cylindrical, conical, slightly curved, rather lyrate, somewhat like the horns of *Damalis lunata*, but less curved; they gradually bend backward at the base, and are at length produced and spread out laterally. (See Gray, Ann. & Mag. N. H. 1869, vol. iv. p. 291.) Mr. Blyth proposed to form the young Gorgon into a genus, under the name of *Butragus*.

1. CONNOCHETES.

Face with a crest of recurved hair in front; chest maned. (Gray, Cat. Ungul. B. M. p. 119, t. 15. f. 4, 5, skull.)

1. **Connochetes gnu.** (The Gnu or Kokoon.) B.M.

Connochetes gnu, *Gray, Cat. Ungul. B. M.* p. 119, t. 15. f. 4, 5.

Junior. Horns conical, erect. (Gray, Ann. & Mag. N. H. 1869, vol. iv. p. 291.)

Hab. South Africa.

2. GORGON.

Face with smooth hair in front, chest not maned. (Gray, Cat. Ungul. B. M. p. 121.)

1. **Gorgon fasciatus.** (The Gorgon or Brindled Gnu.) B.M.

Connochetes gorgon, *Gray, Cat. Ungul. B. M.* p. 121.

Junior. Horns erect, conical (*Butragus corniculatus*, Blyth, MS.).

Hab. South Africa. Flesh worthless; fat hard and unpleasant.

Fam. 12. DAMALIDÆ.

Muzzle moderately broad, with a bald moist muffle. Nostrils close, edged with short rigid hairs. Horns behind the orbits conical, compressed at the base, more or less lyrate. Crumen covered with a tuft of short hair. Body and legs graceful. Hind legs often shorter. Hoofs small; false hoofs well developed. Tail moderate, hairy and subcrested above. Teats two.

Bovine Antelopes, *Gray, Cat. Ungul. B. M.* p. 122.

1. ALCELAPHUS.

Horns on the upper edge of the frontal bone, which forms a much produced posterior ridge, lyrate, thick at the base, with the end suddenly curved at right angles. Hind quarters low. (Gray, Cat. Ungul. B. M. p. 122, t. 16. f. 1, 2, 3, skull.)

1. **Alcelaphus bubalis.** (The Bubale.) B.M.

Pale brown, nearly uniform; rump like the back.

Alcelaphus bubalis, *Gray, Cat. Ungul. B. M.* p. 123.
Boselaphus bubalis, *Blyth, P. Z. S.* 1869, p. 53, f. A, 3 (horns, male); *Heuglin, Antil.* p. 21.

Hab. North Africa: Tripoli.

Var. *tunisianus*, Gray, Cat. Ungul. B. M. p. 123.
Hab. Tunis, *Fraser*.

"This animal is much smaller than the Hartbeest, and is of a uniform bright chestnut-colour, without any markings on the feet." —*Blyth*.

2. Alcelaphus major. B.M.

Alcelaphus tunisianus, *Gray, Cat. Ungul. B. M.* p. 123.
Boselaphus major, *Blyth, P. Z. S.* 1869, p. 53, f. A, 1 (horns, male), 2 (horns, female).

Hab. West Africa: Tunis (*Fraser*).
"As large as the Hartbeest, with black markings on all the feet above the hoofs. The hair of the forehead is chestnut, where it is black in the Hartbeest. So far as I can perceive, the horns of the three North-African species are similar in shape, those of *B. major* being only distinguishable by their superior size; and all may be readily told from those of the Hartbeest by the difference at the base when viewed in front, the horns of the latter diverging in the form of the letter V, those of the others in the form of the letter U."—*Blyth*.

3. Alcelaphus caama. (The Lecama or Hartbeest.) B.M.

Grey brown; dorsal line, streak on face, outer side of limbs black; large triangular spots on the haunches whitish.

Alcelaphus caama, *Gray, Cat. Ungul. B. M.* p. 124, t. 16. f. 1, 2, 3.
Boselaphus caama, *Blyth, P. Z. S.* 1869, p. 53, fig. A, 4 (horns, male), 5 (female).

Hab. South Africa: in flat wooded districts.

4. Alcelaphus Lichtensteinii. (Godoñko.)

Pale brown; back of neck and upper part of back dark brown, separated from the other part of the body by a straight horizontal line; end of tail black; inside of ears white.

Antilope Lichtensteinii, *Peters, Mossambique*, p. 193, t. 43, 44 (skulls).
Boselaphus Lichtensteinii, *Kirk, P. Z. S.* 1864, p. 660.
Boselaphus cama, *Heuglin, Antilop.* p. 22, t. 2. f. 3 (horns).

Hab. Eastern Africa: Shaupagna, in the forest (*Kirk*).
Probably the Hartbeest mentioned by Captain Speke (P. Z. S. 1863, p. 3) at Dhoors.

2. DAMALIS.

Horns over the back of the edge of the orbit, lyrate, subcylindrical or compressed, annulated at the base, over the back edge of the orbit. (Gray, Cat. Ungul. B. M. p. 125, t. 16. f. 4, 5, and t. 3. f. 6, skull and horns.)

* *Horns subcylindrical, diverging from the base.* Acronotus.

1. **Damalis lunatus.** (The Sassayby.) B.M.

Horns subcylindrical, diverging from the base, recurved above; face dark in front.

Damalis lunatus, *Gray, Cat. Ungul. B. M.* p. 125.

Hab. South Africa.

** *Horns compressed, regularly lyrate, nearly parallel at the base, and then recurved.* Damalis.

2. **Damalis senegalensis.** (The Korrigum.) B.M.

Face black-marked; fur rigid, grey.

Damalis senegalensis, *Gray, Cat. Ungul. B. M.* p. 126, t. 16. f. 4, 5 (skull); *Heuglin, Antilopen*, p. 22.

Hab. West Africa: Gambia, Senegal. East Africa: Sennaar. Central Africa: Bornu. Sclater P.Z.S. 1890, 334

3. **Damalis pygarga.** (The Nunni or Bonte Bock.) B.M.

Purple-red, outside of the limbs darker; streak between the horns, face, and rump above tail white. T. III. f. 6, skull.

Damalis pygarga, *Gray, Cat. Ungul. B. M.* p. 127.

Hab. South Africa.

a. *Damalis tiang*, Heuglin, Antilopen, t. 2. f. 1 (head and horns). *Hab.* Sobat.

b. *Damalis tiang riel*, Heuglin, Antilopen, p. 23, t. 2. f. 9. Horns only known. *Hab.* Bahr-el-abiad.

4. **Damalis albifrons.** (The Bless Bock.) B.M.

Purple red; front of face, spot between horns and on temples, the hinder edge of rump below the tail white; throat, stripe down the outer side of front of legs brown.

Damalis albifrons, *Gray, Cat. Ungul. B. M.* p. 129.

Hab. South Africa.

5. **Damalis ? zebra.** (The Doria.) = B.M.

Skull and horns unknown. Bright golden brown, with several black cross bands, narrowing at the end; outside of the fore and hind legs dark brown.

Damalis? zebra, *Gray, Cat. Ungul. B. M.* p. 129.

Hab. W. Africa: Gambia.

Damalis hunteri, Sclater P.Z.S. 1889, 58, 372. E.

Section II. ANGULICORNIA.

Horns subangular, with a more or less distinct ridge on the front angle; and when they assume an angular form the ridge is directed towards the outer side of the horn. Nostrils open, bald within. Grinders without supplementary lobe.

Bovina angulicornia, *Gray, Cat. Ungul. B. M.* p. 131.

Fam. 13. STREPSICEROTIDÆ.

Horns in the males only, subspiral, inclined backwards; the spiral ridge directed towards the inner side of the horn. Nose bovine. Muffle distinct, moist. Nostrils near together in front. Forehead flat. Crumen distinct. False hoofs distinct. Males not bearded on the chin. Fur white-banded or spotted. Females with four teats and a small udder. Skull: intermaxillary reaching to nasals; nasal opening moderate; suborbital fissure distinct, but no fossa.

Strepsicereæ, *Gray, Cat. Ungul. B. M.* p. 131.

The horns of some Goats and Sheep, which are generally recurved backward or spirally twisted, are sometimes nearly straight, with a spiral keel, as *Capra Falconeri* and the Cretan Sheep, *Ovis strepsiceros*.

1. *Limbs equal, and crumen with a very small opening. Nose cervine, moderate. Grinders with no supplementary lobes.* Africa.

A. *Horns with a strong spiral keel. Body large and heavy. Neck with a linear mane. Nose cervine. Muffle small, between and under the front half of nostrils.*

1. STREPSICEROS.

Horns over back edge of orbit, in males only, spirally twisted, ascending from the back of the orbits. Intermaxillary reaching to nasal. (Gray, Cat. Ungul. B. M. p. 132, t. 17. f. 1, 2.)

1. **Strepsiceros kudu.** (The Eechlongole or Koodoo.) B.M.

Front of neck with a divided fringe; the spiral curve of the horns far apart and uniform.

Strepsiceros kudu, *Gray, Cat. Ungul. B. M.* p. 133, t. 17. f. 1, 2 (skull and horns); *Blyth, P. Z. S.* 1869, p. 54, fig. B, 1 & 2 (horns).
Strepsiceros excelsus, *Sundevall; Heuglin, Antil.* p. 12.

Hab. South Africa; Central Africa, on hills over the Lower Zambesi, called *Tolo* (*Kirk*); Abyssinia (*Blyth, Rüppell*).

2. **Strepsiceros ~~tendal.~~** (The Tendal.) ~~B.M.~~

Front of neck not fringed: spiral curve of horns hardly deviating from the straight axial chord.

Damalis kudu, *Smith, Zool. S. Africa.*
Strepsiceros kudu, var., *Gray, Cat. Ungul. B. M.* p. 134.
Strepsiceros imberbis, *Blyth, P. Z. S.* 1869, p. 54, fig. B, 3, 3 *a*.

Hab. ~~Abyssinia~~ (*Rüppell, Harris*). Somali-land.

2. OREAS.

Horns far behind the orbits, in both sexes, straight, bent back and on the same plane as the forehead. Female, horns smaller. Throat with a longitudinal crested dewlap. (Gray, Cat. Ungul. B. M. p. 134, t. 17. f. 3, 4; Taurotragus, *Wagler.*) Feeding on leaves and branches of shrubs (*Kirk*).

1. **Oreas canna.** (The Impoofo or Eland.) B.M.

Pale brown, nearly uniform, with a very few indistinct narrow white stripes on the sides.

Oreas canna, *Gray, Cat. Ungul. B. M.* p. 134, t. 17. f. 3, 4 (skull and horns); *Kirk, P. Z. S.* 1864, p. 659; *Wolf's Zool. Sketches,* tab. xxi.
Boselaphus oreas, *Heuglin, Antil.* p. 19.

Hab. South Africa.

2. **Oreas derbianus.** (The Gingi Jonga.) B.M.

Pale reddish brown; front of the face, the neck, and front part of the underside, a spot on the front and hinder side of the fore leg, and dorsal streak black; sides of the body with fourteen or fifteen white perpendicular streaks.

Oreas derbianus, *Gray, Cat. Ungul. B. M.* p. 135.

Hab. West Africa: river Cassoman (*Whitfield*); Senegal (*Reade*).

a. *Boselaphus gigas,* Heuglin, Antilopen, p. 19, t. 3. f. 2 (horns only). *Hab.* White Nile.

b. *Oreas Livingstonii,* Sclater, MS.; Kirk, P. Z. S. 1864, p. 659; Speke, P. Z. S. 1869, p. . Body banded. *Hab.* Central Africa (*Speke*).

"South of the Zambesi it is uniform in colour, or, at least, not distinctly banded. The colour varies considerably. To the south of that river it is banded. *O. Livingstonii* is scarcely distinct, as it only differs in being banded. The habits of both are identical, and their horns are not to be distinguished."—*Kirk.*

B. *Horns subangular, obscurely keeled. Neck with longer hair, forming a mane. Nose bovine. Muffle rather large, bald between and beneath the nostrils, and a narrow band up the middle of the upper lip. Legs slender. Hoofs and false hoofs small. Females hornless.*

3. EURYCEROS.

Horns over the back edge of orbit, large, elongate, subangular,

with one and a half or two spiral turns. Legs stout. Back and neck more or less maned. Sides cross-banded. Face with an arched wide band between the eyes. (Gray, Cat. Ungul. B. M. p. 136.)

* *Hoofs broad, triangular; body spotted and striped.* Eurycerus.

Tragelaphus

1. **Euryceros euryceros.** (The Bongo.) B.M.

Very bright bay; crescent on chest, very narrow dorsal streak, sixteen perpendicular streaks on each side placed in pairs or threes, front of hind legs, back of fore leg, and a large patch on front of the leg below the knee white.

Tragelaphus euryceros, *Gray, Cat. Ungul. B. M.* p. 136.
Tragelaphus albovirgatus, *Du Chaillu, Proc. Boston Soc. N. H.* 1861, vii. p. 299; *Travels*, t. 44; *Gray, P. Z. S.* 1861, p. 276.

Hab. Equinoctial Africa.

Du Chaillu's figure seems to be a slightly altered copy of the figure of *E. Angasii* in the 'Proceedings of the Zoological Society.'

Afzelius, in 'N. A. Sci. Upsal.' 1815, viii. fig. 3, figures a horn 27 inches long. The horns described by Ogilby, P. Z. S. 1836, p. 120, are 31 inches long, and they are in the British Museum.

A nearly full-grown male?, without the sheaths to the horns, received from M. du Chaillu, and the specimen described in his work as the Bongo Antelope, *T. albovirgatus* (p. 306, t. 44). Bright orange-yellow, with fifteen narrow regular white bands across the body, not regularly placed and not symmetrical on the two sides; nape with a narrow black streak, which is narrow, white, with a few black hairs along the vertebral line. Legs blackish in front, white-spotted, with a large white spot over each hoof. A white crescent before the eye and on the chest. The gullet black.

This animal is very like the female *E. Angasii*, but very much larger, and with very short, close-pressed hair; while in *E. Angasii* the hair is long and soft, and the dorsal crest is black. I should be inclined to regard it as a female, as it has no appearance of any scrotum, but for the presence of horns.

The skull shows that it is full-grown—with perfect teeth, but the sutures are not obliterated; no distinct concavity in front of the orbit; intermaxillaries elongate, narrow, reaching to the nasals; horns placed far behind the orbits.

An imperfect adult skull in the British Museum, which has lost its intermaxillary bones, is 14 inches from the occiput to the end of the maxilla, and 6 inches wide at the back of the orbit. The horns are $27\frac{1}{2}$ inches long.

2. **Euryceros Angasii.** (The Inyala.) B.M.

Dark brown; vertebral streak and four or five narrow streaks on each side white.

Tragelaphus Angasii, *Gray, Cat. Ungul. B. M.* p. 137.

Hab. South Africa: Port Natal (*Angas*).

Male blackish, with a white dorsal crest and five white streaks across the sides. Spot on face, chest, legs, and end of tail white. Female and young bright bay, with numerous white stripes across the body. (P. Z. S. 1848, t. 4 and 5.)

Skull, adult: length 13 inches; width at back of orbit $5\frac{1}{8}$ inches; nose to front of orbit $7\frac{1}{2}$ inches; length of horns along the curve 26 inches.

** *Hoofs elongate, narrow. Fur one colour in both sexes.* Hydrotragus.

Tragelaphus.

3. **Euryceros Spekii.** (The Nakong.) B.M.

Dull bay, nearly of one colour; the dorsal streak paler, inconspicuous; inside the ears, spot on each side of nose, under the eyes and chin whitish. Tail elongate, nearly cylindrical, above brown, beneath white. Hoofs elongate, strong. Horns very like those of *T. euryceros*, but longer, more slender, black, with white tips.

Antilope euryceros, *P. Z. S.* 1848, p. 88.
Tragelaphus eurycerus, var. 1, *Gray, Cat. Ungul. B. M.* p. 137.
Tragelaphus Spekii, *Sclater, P. Z. S.* 1864, p. 103 (fig., p. 104, horns and feet), t. 12; *Kirk, P. Z. S.* 1864, p. 659.

Hab. Kohhi (*Allen*), Central Africa; Karagweh (*Speke*).

The fur is very long and coarse, as in *T. Angasii*, of a mouse-colour. Front of head reddish; narrow dorsal streak paler, with some whitish hairs; tail darker, underside and terminal tuft white.

I have little doubt that this animal was first noticed by Capt. William Allen, R.N. He says it is "3 feet high, or rather more, of a darkish brown colour; but I do not remember any white band across the forehead; and the horns are said to be like *A. euryceros*, from Kohhi, on the Cameroon River, in the Bight of Biafra." (P. Z. S. 1848, p. 88.) The horns are in the British Museum, and evidently belong to this species. (*T. eurycerus*, var. 1, Gray, Cat. Ungul. B. M. p. 136; Cat. Bones Mamm. p. 246.)

A pair of horns and a separate one, purchased of M. Parzudaki, from the Gaboon, appear to belong to this species. The separate horn is peculiar from having a black tip.

A skin of a young specimen with small horns, and a pair of long horns from Guami, received from Capt. Speke, 1863. Tips whitish.

A small pair of horns, received from J. A. Green, Esq., in 1856, from Guami, as *T. Angasii*. (Cat. Bones Mamm. p. 246.)

Mr. Layard informs me that the skin of a male specimen in bad state in the British Museum was brought from the Zambesi by E. Chapman, Esq., and given to Mr. Layard, who sent it to Mr. Edward Verreaux, who, in February 1860, sold it to the Museum as "*Antilopus roualeynii*. The Bush-buck of Limpupu (*Gordon Cuming*), South Africa." Fur long, soft, of a nearly uniform pale brown colour, with a white streak on the side of the eye; chin whitish.

Var. *fusca*. Blackish brown. *Hab.* Gaboon. B.M.

We received from M. du Chaillu, in 1865, a very bad imperfect skin of this species, which had been preserved in salt, from Gaboon. It differs from the Zambesi specimen in the fur being of a darker colour. The apex of the horn and the inner side of the twist form a straight line.

4. TRAGELAPHUS.

Horns over back edge of orbit, moderate, nearly straight, with only one spiral turn, subangular, ascending obliquely from the back edge of the orbit. Body light; legs slender; hoofs small. Face without any white cross band. Adult males with a longitudinal crest of long hair. (Gray, Cat. Ungul. B. M. p. 136, t. 18. f. 1, 2, skull and horns.)

* *Back with perpendicular bands and lateral streaks.*

1. Tragelaphus scripta. (The Guib.) B.M.

Pale bay; neck with four cross bands and a central white streak.

Tragelaphus scripta, *Gray, Cat. Ungul. B. M.* p. 138, t. 18. f. 1, 2 (skull).

Hab. West Africa: Senegal and Gambia; Cameroons, Mount Victoria (*Burton*, B.M.)

2. Tragelaphus decula. (The Decula.) B.M.

Grey-brown; back with three or four indistinct cross bands; arched streak on upper part of side, a few spots forming an arch on the haunches, dorsal line, streak on nose and on front of fore legs blackish.

Tragelaphus decula, *Gray, Cat. Ungul. B. M.* p. 139; *Heuglin, Antilopen*, p. 20, t. 1. f. 5 (head and horns).

Hab. E. Africa: Abyssinia.

** *Back without any cross bands or lateral streaks.*

3. Tragelaphus sylvatica. (The Bosch Bock.) B.M.

Blackish brown; head pale brown; band across forehead black; small spot on haunches, larger spot on inner sides of legs and on feet white.

Tragelaphus sylvatica, *Gray, Cat. Ungul. B. M.* p. 139; *Kirk, P. Z. S.* 1864, p. 659; *Heuglin, Antilopen*, p. 20; *Peters, Mossambique*, p. 185.

Hab. South Africa, Central Africa, Lower Zambesi (*Kirk*).

"Varies greatly in colour and spotting. Hoofs elongate in muddy regions."—*Kirk*.

Antilope triangularis Günther. P. Z. S. 1889
S. Central Africa.

2. *Hind legs much shorter than the fore. Horns on back edge of frontal bone behind the orbit, short, conical, obscurely angular. Nose bovine. Muffle large and moist. Skull: nasal opening small; molars with supplementary lobes.* Asia.

5. PORTAX.

Portax, *Gray, Cat. Ungul. B. M.* p. 141, f. 2 (skull).

1. **Portax tragocamelus.** (The Nilghau.) B.M.

Portax tragocamelus, *Gray, Cat. Ungul. B. M.* p. 141.

Hab. India.

Fam. 14. CAPRIDÆ.

Horns behind the orbit, erect, compressed, curved backwards, with a longitudinal keel in front, deeper than wide at base. Nose ovine or subcervine; nostrils close together in front. Forehead convex, elevated behind. Chin of males bearded. Crumen none (?). Hoofs four-sided, scarcely higher before than behind. Teats two, rarely four. Males emitting a strong stench. Skull with small suborbital fissure and no fossa.

Capreæ, *Gray, Cat. Ungul. B. M.* p. 142.

1. *Nose subcervine; muffle small, moist between the nostrils.*

1. HEMITRAGUS.

Horns short, recurved, trigonal, compressed, nodose in front. Male not bearded; neck maned. (Gray, Cat. Ungul. B. M. p. 144, t. 18. f. 3, 4.)

1. **Hemitragus jemlaicus.** (The Jharal or Tehr.) B.M.

Hemitragus jemlaicus, *Gray, Cat. Ungul. B. M.* p. 144, t. 18. f. 3 & 4.

Hab. India: Nepal, the Kachar.

2. KEMAS.

Horns short, thick, recurved, quadrangular, flat in front, and rounded on the outside, closely ringed. Male bearded. (Gray, Cat. Ungul. B. M. p. 146, t. 19. f. 1, 2, skull.)

1. **Kemas warryato.** (The Warryato or Jungle Kemas.) B.M.

Kemas warryato, *Gray, Cat. Ungul. B. M.* p. 146, t. 19. f. 1 & 2.

Hab. India: Neilgherries.

2. *Nose ovine, hairy, without any muffle; chin bearded.*

3. ÆGOCEROS.

Horns rounded, conical. Ears densely pilose. Hair of forehead simple. (Gray, Cat. Ungul. B. M. p. 147, t. 20. f. 4, 5, 6.)

1. **Ægoceros pyrenaica.** (The Pyrenean Tur.) B.M.

Face black in front, paler on the sides; horns keeled behind, flat on the inner side.

Ægoceros pyrenaica, *Gray, Cat. Ungul. B. M.* p. 147, t. 20. f. 4–6.
Capra ægoceros hispanica, *Schimper: Rosenhauer, Thiere Andalusiens*, t. 1 & 2.
Capra pyrenaica, *Blasius, Säugeth. Deutsch.* p. 430, f. 527 (horns).
Capra hispanica, *Grael.*

Hab. Europe; Pyrenees, Spain (*Grael*).

2. **Ægoceros caucasica.** (The Tur or Zack.) B.M.

Horns not keeled behind.

Ægoceros caucasica, *Gray, Cat. Ungul. B. M.* p. 148.
Capra caucasica, *Blasius, Säugeth.* p. 479, f. 255, 256 (horns).

Hab. Caucasus, Aladagh.

4. CAPRA.

Horns of male very long and recurved, nearly on the same plane; base subquadrangular, broad, flattened, and with broad cross ribs in front; outer side rather compressed and rounded; tip compressed, broad: of female, smaller. Hair of forehead elongate, whorled. Crumen and inguinal pore none. Chin bearded. (Gray, Cat. Ungul. B. M. p. 149, t. 19. f. 3, 4, as *Ibex*.)

* *Horns thick, moderately long; ears densely pilose.*

1. **Capra ibex.** (The Ibex or Steinbock.) B.M.

Capra ibex, *Gray, Cat. Ungul. B. M.* p. 149; *Blasius, Säugeth. Deutsch.* p. 475, f. 253, 254.
Swiss Ibex, *Blyth, Field*, fig.

Hab. European Alps.

** *Horns compressed, very long.*

2. **Capra sibirica.** (The Tek or Takiga.) B.M.

Capra sibirica, *Gray, Cat. Ungul. B. M.* p. 150; *Blasius, Säugeth. Deutsch.* p. 481, f. 259, 260 (horns).
Asiatic Ibex, *Blyth, Field*, f. 1, 2.
Capra himalayana, *Gray, Cat. Ungul. B. M.* p. 150.

Hab. Siberia.

3. **Capra nubiana.** (The Beden or Jaela.) B.M.

Capra nubiana, *Gray, Cat. Ungul. B. M.* p. 151, t. 19. f. 3–5 (as Ibex nubiana).
Capra beden, *Blasius, Säugeth. Deutsch.* p. 482, f. 251, 252.

Hab. North Africa; Egypt; Crete; Arabia; Senegal.

a. *Capra valie*, Gray, Cat. Ungul. B. M. p. 152; *Capra beden*, var., Blasius, Säugeth. Deutsch. p. 483. *Hab.* Abyssinia, Mus. Frankfort (male only).

b. Capra? lævicornis, Gray, Cat. Ungul. B.M. p. 151. *Hab.* ——? Perhaps a hybrid between *C. ibex* and *Hircus ægagrus*.

5. HIRCUS.

Horns compressed, with a narrow, thin, nodose or torn keel in front, outer side convex, rounded behind. Ears covered with short adpressed hair. Hair of forehead like back, rather whorled. (Gray, Cat. Ungul. B. M. p. 152.)

1. **Hircus ægagrus.** (The Goat.) B.M.

Hircus ægagrus, *Gray, Cat. Ungul. B. M.* p. 153, t. 20. f. 1–3 (skull and horns, as *Capra hircus*).
Capra ægagrus, *Blasius, Säugeth. Deutsch.* p. 485, f. 264, 265 (horns).

Hab. Domesticated. Europe?

Var. Domestic.

Capra hircus, *Blasius, Säugeth. Deutsch.* p. 284, f. 263 (skull and horns).

2. **Hircus gazella.** B.M.

Beard full, black; face pale brown, with a slightly marked streak from orbit to the side of the nose; horns very large (larger than any Ibex).

Hircus gazella, *Fitz.*; *Heuglin.*
Hircus thebaicus, *Fitz.*; *Heuglin.*
? Capra caucasica, *H. Smith, Griffith's A. K.* (not *Gülden.*).

Hab. Persia (*Leadbeater*).

3. **Hircus berbura.** (The Berbura.)

Horns having a spiral turn, compressed at the base, convex before and concave behind; ears short; chin not bearded; fur smooth; throat of male with a long dewlap; back of male with an erect spinal crest and tufts of long hairs on the hind legs.

Hircus ægagrus (12. Berbura Goat), *Gray, Cat. Ungul. B. M.* p. 157.

Hab. India, west of the Jumna.

4. **Hircus Falconeri.** (The Markohr.) B.M.

Horns very large, more or less twisted, varying from the curva-

ture of those of the *Koodo* (*Antilope strepsiceros*), only in an opposite direction, to the straight with spiral keel of the *Impoofo* (*A. oreas*); size large; brown, like domestic Goat.

Hircus ægagrus, var. 1, *Gray, Cat. Ungul. B. M.* p. 159.
Capra Falconeri, *Heuglin.*

Hab. India: Cashmere Mountains, Little Thibet.

Fam. 15. OVIDÆ.

Horns behind the orbit, more or less spiral, wider than deep at the base, slightly angulate in front, often wanting in the females. Nose ovine. Forehead flat or concave. Chin of males not bearded. Hoofs triangular, shallow behind. Males emitting no stench. Skull with no suborbital fissure and a more or less marked rounded depression; intermaxillaries moderate, reaching the nasals.

Oveæ, *Gray, Cat. Ungul. B. M.* p. 160.

A. *Crumen distinct; skull, infraorbital pit deep.*

1. OVIS.

Horns more or less spiral, bent inwards at the tip. Tail elongate. Body covered with wool or close-pressed hair. Skull with a more or less deep suborbital pit, but no fissure. (Gray, Cat. Ungul. B. M. p. 161.)

1. Ovis (Aries) aries. (The Sheep.) B.M.

Ovis aries, *Gray, Cat. Ungul. B. M.* p. 161; *Blasius, Säugeth. Deutsch.* p. 467, f. 240 (skull and horns).

Hab. Domesticated.

2. Ovis Polii. (The Rass or Roosh.) B.M.

Ovis aries, var. *z*, *Gray, Cat. Ungul. B. M.* p. 165.
Ovis Polii, *Blyth, P. Z. S.* 1840, p. 62; *Ann. & Mag. Nat. Hist.* vii. p. 159, t. 4. f. 1, 2.
Ovis cultorum, *Blyth, P. Z. S.* 1840, p. 63; *Ann. & Mag. Nat. Hist.* vii. p. 159, t. 4. f. 3, 4.

Hab. Bokhara.

2. CAPROVIS. (Moufflons or Wild Sheep.)

Horns (in males only) bent in half-circle over the back, heavy, wrinkled, angular, and compressed. Tail short, deer-like, without any tail-disk. Hair thick, entirely concealing the woolly undercoat. (Gray, Cat. Ungul. B. M. p. 171, t. 21. f. 1–3, skull.)

a. Musimon.—*Tail very short; horns with the outer edge not prominent, and rounded; "crumen large"* (Blyth).

1. Caprovis (Musimon) Vignii. (The Shapoo.) B.M.

Ovis vignii, *Blyth, P. Z. S.* 1840, p. 70; *Ann. & Mag. Nat. Hist.* vii. p. 251; *Journ. As. Soc. Beng.* x. p. 873 (partim); *Horsfield, Cat. Mus. E. I. C.* p. 175 (specimen A, from Strachey's Collection); *Gray's Cat. Ungul. in Brit. Mus.* (1852), p. 172; *Adams, P. Z. S.* 1858, p. 526 (partim); *Sclater, P. Z. S.* 1860, pl. 79, & p. 127, fig. skull.

Shá of Little Thibet, *Blyth.*

Shapos of the Tibetans, *Speke.*

Hab. Thibet.

"*Male.* Horns subtriangular, rather compressed laterally, rounded posteriorly, transversely sulcated, curving outwards and backwards from the skull, points divergent; general colour above brownish grey, beneath paler; belly white; beard short, of stiffish brownish hair.

"*Female.* Very similar to the male, but with the horns shorter (?).

"*Hab.* Ladakh, at an altitude of 12000–14000 feet (*Speke, Strachey*).

"*Mus. Brit.*, East-India Company.

"This wild Sheep inhabits the elevated regions of Ladakh, where it has been pursued and obtained by Capt. Speke, Capt. Strachey, and others since the discovery by Vigne. There are examples in the British Museum and in the collection of the East-India Company, from the latter of which Mr. Sclater's figure is taken, being the specimen procured in Ladakh by Capt. Strachey."

2. Caprovis cycloceros. (The Oorial.) B.M.

Wild Sheep of Hindoo Koosh, *Capt. Hay, Journ. As. Soc. Beng.* ix. p. 440.

Ovis cycloceros, *Hutton, Calcutta Journ. N. H.* ii. 1842, p. 514, pl. 19.

Ovis vignii, *Blyth* (partim); *Adams, P. Z. S.* 1858, p. 526; *Horsfield, Cat. Mus. E. I. C.* p. 175 (spec. B); *Sclater, P. Z. S.* 1860, t. 80, p. 128 (fig. skull).

"*Male.* Horns subtriangular, much compressed laterally and posteriorly, transversely sulcated, curving outwards and returning inwards towards the face, points convergent; general colour rufous-brown, face livid, sides of mouth and chin white; belly, legs below the knees, and feet white; blotch on flanks, outside of legs, and strong lateral line blackish; a profuse black beard from throat to breast, intermixed with some white hairs, reaching to the level of the knees.

"*Female.* More uniform pale brown, beneath paler, belly whitish, no beard; horns quite short and straight, about 3 inches long.

"*Hab.* Sulimani range of Punjab, altitude 2000 feet, and extending into Afghanistan; Kojeh Amraun, Hindo Koosh, and Huzarreh Hills (*Hutton*). *Mus.* East-India Company (horns). Gardens of the Zoological Society.

"The very fact of this animal inhabiting the low Salt range of the Punjab, at an altitude of 2000 feet, would indicate the probability of its distinctness from the preceding, which is not found under an elevation of 12000 feet. The Oorial has been well described by Major Hay, Captain Hutton, and Dr. Adams, as above referred to; and it is hardly necessary to repeat the details of its habits and manners. The differences in the horns, as well as those of its general external appearance, are sufficiently obvious, as will appear on examination of the figures, to leave no doubt as to its specific difference from the *Shapoo*. The skull and horns from Griffith's Afghanistan collection, referred to in Dr. Horsfield's 'Catalogue of Mammalia' (p. 175), belong to the species. On comparing the skull with that of the *Shapoo*, we observe a general resemblance. But it may be noted that the suborbital pits in the present species are smaller, deeper, and more rounded, the nasal bones are considerably shorter and more pointed, and the series of molar teeth (formed in each skull of three premolar and three true molars) measures only 2·85 instead of 3·20 inches in total length."

3. **Caprovis (Musimon) orientalis.** (The Armenian Sheep.) B.M.

Caprovis (Musimon) orientalis, *Gray, Cat. Ungul. B. M.* p. 172.
Ovis orientalis, *Blasius, Säugeth. Deutsch.* p. 472, f. 249, 250 (skull and horns).

Hab. Armenia; Erzeroom (*Curzon*); Tunis (*Fraser*). (See Blyth, 'Land and Water,' Feb. 1867.)

4. **Caprovis musimon.** (The Moufflon.) B.M.

Caprovis musimon, *Gray, Cat. Ungul. B. M.* p. 173.
Capra musimon, *Blasius, Säugeth. Deutsch.* p. 471, f. 247, 248 (skull).

Hab. Sardinia; Corsica.

5. **Caprovis arkal.**

Ovis arkal, *Blasius, Säugeth. Deutsch.* p. 469, f. 243, 244 (skull and horns).

Hab. Borders of the Caspian Sea; Turcoman.

6. **Caprovis ophion.**

Caprovis musimon, var., *Gray, Cat. Ungul. B. M.* p. 173.
Ovis cyprius, *Blasius, Säugeth. Deutsch.* p. 473, f. 251, 252 (skull and horns).
Ovis cyenica, *Fitzinger.*

Hab. Cyprus; Candia; Corsica.

a. *Ovis anatolica*, Valenciennes, Rev. et Mag. de Zool. p. 346.
Hab. Bulgardash. Between *O. musimon* and *O. tragelaphus*.

b. Argali.—*Tail very short; horns long, heavy, with the tips bent inwards, and with the two edges equally prominent; throat and sides without any dark streak.*

7. **Caprovis (Argali) argali.** (The Argali.) B.M.

Capra montana, *Fischer.*
Ægoceros montana, *Wagner.*
Caprovis (Argali) argali, *Gray, Cat. Ungul. B. M.* p. 174.
Ovis montana, *Baird, Mam. North Amer.* p. 674, f. 593, and var. f. 1608.
Ovis argali, *Blasius, Säugeth. Deutsch.* p. 468, f. 241, 242 (from Altai).

Hab. Siberia, Kamtschatka, and Rocky Mountains.

8. **Caprovis (Argali) bambhera.** (The Bambhera or Bhaaral). B.M.

Horns angular, compressed, closely wrinkled, turned almost into a perfect circle, their flat points directed forwards and outwards. It has a short disk on the tail, and no beard.

Caprovis argali, var. 2, *Gray, Cat. Ungul. B. M.* p. 174, t. 21. f. 4 (skull).
Ovis Hodgsoni, *Blyth, P. Z. S.* 1840, p. 65; *Sclater, P. Z. S.* 1860, p. 129.
Ovis ammon, *Hodgson.*
Ovis ammonoides, *Hodgson.*

Hab. Cachar region of Nepal (*Hodgs.*); Ladakh (*Speke*).

"*Ovis argali* ex Mont. Himalay., J. E. Gray, the Ammon or Argali of the higher Himalayan ranges, the *Banbhera* of Nepal, and *N'yan* of Thibet. It is, I believe, not yet quite certain that this magnificent Sheep is identical with *Ovis ammon*, Linn. (*Ægoceros argali*, Pallas), of Siberia. Mr. Blyth's appellation appears to be the first given to the Himalayan animal. Two fine males and a female of this species are in the Museum of the East-India Company."

9. **Caprovis (Argali) canadensis.** (The Taye or Big-horn.) B.M.

Caprovis canadensis, *Gray, Cat. Ungul. B. M.* p. 176.
Ovis montana, *Blasius, Säugeth. Deutsch.* p. 470, f. 245, 246.

Hab. North America: Rocky Mountains, California.

B. *Crumen none; skull without infraorbital pit; tail moderate.*

3. PSEUDOIS.

Tail rather elongate, not tufted at the end. Forehead convex. Skin covered with thick fur, with a dark lateral streak. (Gray, Cat. Ungul. B. M. p. 177, t. 22. f. 3.)

1. **Pseudois nahoor.** (The Nahoor, or Nervate, or Sna.) B.M.

Pseudois nahoor, *Gray, Cat. Ungul. B. M.* p. 177, t. 22. f. 1 (head).

Hab. Nepal, Ladakh.

Var. *burrhel*, Gray, *l. c.* p. 178.

Hab. Barinda Pass.

"*Ovis nahoor*, Hodgson (*O. burrhel*, Blyth?); the Burrhel or Bhārāl of English sportsmen; *Nahoor* of Nepal. I confess I am not able at present to appreciate thoroughly the differences between the *O. nahoor* and the *O. burrhel* as insisted on by Mr. Blyth. There are not sufficient specimens of the whole animal at present accessible to enable one to express a decided opinion on the subject. But, comparing the horns of *O. nahoor* in the British Museum, sent by Mr. Hodgson from Nepal, with those of the only example of the Burrhel in the same collection (being the specimen noticed by Mr. Ogilby in Proc. Zool. Soc. 1838, p. 79, as obtained by Lieut. Thomas Smith, near the Barinda Pass, and referred to as belonging to this species by Mr. Blyth himself (Proc. Zool. Soc. 1840, p. 68), I can see but slight grounds for distinction, as far as the horns go. The specimen in question is certainly coloured in an extraordinary way, being of a 'dark and rich chestnut brown.' The ordinary Burrhel (*Ovis nahoor*), as may be seen by the fine skins of both sexes of this species, obtained by Capt. Townely Parker, now before us, is of a light brownish ash-colour, white below, with the breast-mark, a stripe on each side, and a stripe down the front of each leg, dark chestnut. According to 'Mountaineer,' who has given an excellent account of the Burrhel and its habits in the 'India Sporting Review' (vol. vi. p. 152), these chestnut markings become black in fully adult males, and are 'most observable immediately after the animal changes his coat, which happens in July.' With reference to the *Ovis burrhel* of Mr. Blyth, 'of a dark mahogany colour,' the same experienced observer remarks, 'Amongst some hundreds I have killed and many thousands I have seen in my excursions I have never met with but one variety.' This he describes nearly in the same terms as I have mentioned above.

"The horns of the *Ovis Polii* of Central Asia are sometimes brought to this country from the Himalayas; but there is no reason to believe that this animal occurs nearer to India than the plateau of Pamîr."—*Sclater, P. Z. S.* 1860.

4. AMMOTRAGUS.

Tail rather elongate, tufted at the end. Forehead concave. Chin covered with short hair, with longer hair on neck and legs. (Gray, Cat. Ungul. B. M. p. 179.)

1. Ammotragus tragelaphus. B.M.

Ammotragus tragelaphus, *Gray, Cat. Ungul. B. M.* p. 179, t. 22. f. 2, 3 (skull).

Hab. North Africa.

Suborder II. DICRANOCERA.

Front of upper jaw callous, toothless. Horn-like prominences over the orbit on the frontal bone permanent, covered with a hairy skin and a deciduous subhorny sheath formed of matted hair. False hoofs none.

In the 'Proceedings of the Zoological Society' for 1855, I mentioned that the horn of the Prongbuck was "formed of agglutinated hair, that it was lined internally with a close velvet-like coat of short hairs, which were directed towards the top of the cavity, and that the edge of the base of the horn was furnished with a ring of hair." I observed that the "peculiarity in the internal structure of the horns of the genus showed, like the branched external form, a similarity to the horns of the Deer, the hairy horns being the analogue of the deciduous velvet of the Deer and the permanent hairy coat [on the horns] of the Giraffe."

The peculiarity in the structure of the horn, which isolates the Cabrit or Prongbuck from the other hollow-horned Ruminants seems to have been overlooked by the American naturalists; and the spoils of the animal are very rare in European museums.

The hunters of America stated that the Prongbuck shed its horns; but the systematic zoologists, who depended on the examination of the preserved skin and head for their facts, did not believe the assertion; and, indeed, some went so far as to deny the fact.

When the hunters at Fort Union said that the prong-horned Antelope dropped its horns, Messrs. Audubon and Bachman (Quad. North America, p. 198) considered it a sufficient reply to show them that "the bony part of the horn and the hard spongy membrane beneath were well attached to the skull and perfectly immovable." They evidently had the deciduous horn of the Deer in their mind, and could not conceive any other manner of shedding the horns, not foreseeing that the horny sheath might drop off the cores, which, if they had examined the structure of the horn and observed its internal fur, they might have anticipated as probable.

Cassin, in the 'United-States Exploring Expedition' (p. 63), under *Antilocapra americana*, remarks, "Dr. Pickering, in his note under 24th August 1841, observes, Dr. Marsh assures me that the horns of this animal are shed annually, like those of the Deer."

Dr. Colbert A. Canfield, who resides in California, sent an account of the habits of the Prongbuck (in which he states as a fact that "the horns drop off annually") to Dr. Spencer Baird, of the Smithsonian Institution; but his paper (which is dated Sept. 10, 1858) was not published until after Mr. Bartlett had recorded his observation of the same fact, observed on the animal in the Zoological Society's Gardens.

Dr. Colbert Canfield's paper is printed in the 'Proceedings of the Zoological Society,' 1866, p. 105, and contains many very interesting particulars on the habits and manners of the animal.

Dr. Canfield truly observes that the horns of Sheep and Goats

always have rings showing the growth of the horns, and that such rings are not to be observed on the horns of the Prongbuck.

When Dr. Canfield says that "the horns drop off annually," and observes to Dr. Spencer Baird, "To convince you of this singular fact is my principal object in making you this communication," he only intended to say that the horny sheath of the horns fell. The American hunters and Dr. Marsh must have intended the same, though Dr. Bachman and M. Audubon were deceived by the vagueness of the hunters' words; and even Dr. Marsh, when he added "like the Deer," could only have intended to say that the case of the horns falls annually, and not that the entire horn or antler falls, as is the case with the Deer.

The shedding of the horns of *Antilope capra* had been previously noticed by Dr. Weinland (Zool. Gart. 1863, p. 255), who incidentally speaks of it as of an abnormal formation; and more explicitly by Hr. Martin (ibid. 1864, p. 254), who regarded the old shed horn, still adhering to the top of the new one, as the new horn which would grow *downwards* to the base of the frontal bone.

Mr. Bartlett, in the 'Proceedings of the Zoological Society' for 1865, p. 718, gave a very interesting and detailed account of the manner in which the horny case of the horn separates from the core, and how the new horny case is formed between the inner surface of the old case and the core.

Mr. Bartlett, in this paper, endeavours "to prove that the Prongbuck's affinities are closer to the genus *Cervus*," to which he thinks "it is more nearly allied than to the Antelopes." Indeed he thinks he is "able to show that the horns of the Prongbuck are a modification of the horns of *Cervus*."

In this view I think Mr. Bartlett is entirely mistaken, and that this theory obscures the otherwise very interesting details which he gives of the peculiarities of this animal.

In the hollow-horned Ruminants the bony processes of the frontal bone, which form the true horns of this group of animals, are permanent, and are covered, in the Oxen, Sheep, Goat, and Antelopes, with a horny case, which is increased in size as the core enlarges by the addition of new laminæ of horny matter to the inner surface, especially near the edge of the sheath. The Giraffes, on the other hand, have the same permanent cores, which are covered with a hairy skin, like the rest of the body, which covers the horn during the entire life of the animal.

The horns of the Deer, with which Mr. Bartlett compares those of the Prongbuck, on the other hand, are only developed at a certain season of each year; and while they are being expanded they are covered with a soft velvety skin containing a large number of large blood-vessels: these vessels become obliterated, and the skin falls off when the horns are fully developed; and at the end of the season the horns themselves fall off, leaving only a burr on the frontal bones.

Now in the Prongbuck the core of the horn is permanent, vascular, and exactly like the core of the horns of the true hollow-horned

Ruminants, very unlike the deciduous horn of the Deer—showing the true affinity of the genus to the Antelope and Goat, with which it has usually been associated. It indeed only differs from the normal structure of that of the animals of this group in the core being covered with a case formed of agglutinated hair, which falls off annually, and is replaced by another case formed between its cavity and the outer surface of the core. The surface of the core is covered with a vascular skin, which secretes this deciduous coat of agglutinated hair, like the vascular coat that secretes and gradually enlarges and thickens the horny permanent case of the horns of Oxen, Sheep, and Goats.

It is to be observed that the horny case of the core of all these animals is formed of agglutinated hair; but the hairs of the horns of the Oxen, Sheep, &c. are more closely agglutinated and regularly placed, forming a denser substance than the porous horny case of the Prongbuck, in which the several hairs of which it is composed are to be seen by the naked eye, and some of them projecting beyond its surface.

I think the above observation proves that the Prongbuck is more nearly allied to the typical hollow-horned Ruminants, with which it has been placed, than to the deciduous-horned Deer, with which Mr. Bartlett proposes to unite it. Indeed it only differs from them in the outer case of the horn being porous and formed of loosely agglutinated or, rather, felted hairs, and in the case being deciduous and renewed annually, instead of being permanent and strengthened by internal laminæ so as to form a hard horn.

There is no doubt that this peculiarity of the structure and derivation of the sheath, or rather case, of the horns affords a very good character to separate the Prongbuck from the other hollow-horned Ruminants; and I suggest that it should be formed into a family, which should be called Antilocapridæ, of equal rank with Bovidæ and Giraffidæ, between which families it ought to be placed. (Gray, Ann. & Mag. Nat. Hist. 1866, xviii. pp. 323–326.)

After my notes on this family were written and the manuscript sent to the printer, I heard that Dr. Sclater had made some observations on the genus at the British-Association Meeting at Nottingham. I am very glad to find that Dr. Sclater agrees with me in the necessity of forming the genus into a peculiar family.

Dr Sclater has adopted Dr. Sundevall's division of the Ruminants into two groups, according to the form of the foot; but I think his change of Sundevall's term *Digitigrada* into *Phalangigrada* is to be regretted, as adding a useless synonym.

There is no doubt that the form of the *placenta* is an interesting physiological fact; but I doubt its applicability to zoological classification. It is only to be observed at one period of the animal's life, and is only known in a very few species: for example, I am not aware that it is known in *Antilocapra*, the genus under consideration; and if it differs in two genera so nearly allied as *Tragulus* and *Moschus*, which many modern zoologists consider species of one genus, what right have we to assume that it is similar in all the

genera of *Bovidæ* and *Cervidæ*, more especially as the placenta of very few species of the large group of Antelopes and Deer is known.

Dr. Sclater proposes to divide the *Ruminantia unguligrada* with placenta polycotyledonaria, into *pedes didactyli* and *pedes tetradactyli*; but this character will not separate *Antilocapridæ* from *Bovidæ*, unless he proposes to arrange several animals which have been called Antelopes, and which have simple horns with a permanent horny sheath, and which therefore do not agree with his other characters of the group, in the family *Antilocapridæ*; for the genera *Nesotragus* and *Nanotragus*, and one species of the genus *Calotragus*, are as destitute of false hoofs as the genus *Antilocapra*. Dr. Sundevall considers the absence of this false hoof of so little importance that he places two species in the genus *Calotragus*, one having large, and the other being entirely without false hoofs. Dr. Sclater must have overlooked this fact when he says, "two other points in which the Pronghorn differs from all the other *Bovidæ*," and proceeds, "in the absence of the 'false hoofs,' as the stunted terminations of the rudimental second and fifth digits of each foot are termed." (Gray, Ann. & Mag. N. H. 1866, xviii. pp. 468, 469.)

Pronghorn (*Antilocapra*).—"His horns lately seem to have diverged a good deal; and upon feeling the base of them it seems likely that they are about to be shed. *When this happens the bony core is invested with a hairy skin, and the cuticle of the skin* [!] *becomes gradually thickened and grows out to become the new corneous sheath*, of greater ultimate dimensions than its predecessor, until the full size is attained. But in this animal there is no shedding and renewal of the bone, as in the case of the Deer family."—*F. Buckland, Land and Water*, Sept. 29, 1866, p. 228. The bony core is always invested with a skin, it is only new hair that is developed.

Fam. 16. ANTILOCAPRIDÆ.

The bony process of the frontal bone, over the orbit, covered with a porous horny coat, which falls off and is renewed annually.

The horn or pseudo-horn (*komoceras*) of the Cabrit is *sui generis*. It is formed of the matted or felted hair of the skin that covers the core. It loosens and falls off in the mass, when the new coat of matted hair is formed beneath it. The horns may be compared to the annual coat of matted hair which is shed by the American Bison and some other ruminants; but in that animal the hair only forms a kind of blanket, and falls off in flakes of different sizes.

Antilocapridæ, *Gray, Ann. & Mag. N. H.* 1866, xviii. pp. 326, 468; *Sclater, Ann. & Mag. N. H.* xviii. p. 403.

Dr. Sclater also erroneously supposes that, after the horn is per-

fected and hardened, new hairs develope themselves beneath the epidermis! (*l. c.* p. 402).

The bony processes of the frontal bone are covered with a skin that secretes an external horny coat, which is periodically deciduous, the new horny sheath being formed within the cavity at the base of the old sheath. The horny sheath is formed of agglutinated hair, some of the hairs being free at the outer part of the base. The sheath, when first formed, is pale, soft, and flexible, but soon hardens and becomes black. It has a compressed projection or prong on the front edge below the tip.

Intermaxillaries moderate, reaching the nasals.

1. ANTILOCAPRA.

Horns erect, arising directly over the orbits, compressed at the base, with a flattened process in front, and ending in a conical recurved tip. Nose ovine, hairy. Muffle none. Tear-bag none. Fur very short, close. Hair stiff, coarse, flattened, and wavy. False hoofs none. Inguinal pores none. Tail very short. Legs rather slender. Female horned. Skull with no suborbital depression; nasal bones wider behind.

Antilocapra, *Gray, Cat. Ungul. B. M.* p. 116, t. 15. f. 1, 2, 3 (skull); *S. Baird, Mamm. N. A.* p. 665, t.; *Murie, P. Z. S.* 1870, pp. 355, 359, figs. 6, 7 (skull).

1. Antilocapra americana. (The Cabrit or Pronghorn.) B.M.

Antilocapra americana, *Gray, Cat. Ungul. B. M.* p. 117, t. 15. f. 2, *as* Dicranoceros furcifer; *S. Baird, Mamm. N. A.* p. 665, t.; *Murie, P. Z. S.* 1870, p. 334 (anat.).
Dicranoceros americanus, *Turner, P. Z. S.* 1850, p. 174.

Hab. North America. In the plains in summer, and in the mountains in winter.

2. Antilocapra anteflexa.

The horns compressed, dark brown, rugose, rounded and curved and arched behind, compressed in front, becoming more so as they reach the supramedian frontal process. The *apex* subtrigonal, evidently compressed and angularly *bent forward* rather above the *compressed frontal process*, with a deep furrow rather on the inner side of the middle of the hinder part of the bend; the inner edge of the recurved tip is rounded, the outer compressed, rather produced and sharped-edged; the extreme tip is roundish, tapering, with a white end.

Antilocapra anteflexa, *Gray, P. Z. S.* 1855, p. 10 (figure of horns).

Hab. North America? *Mus.* Derby, Liverpool.

The colour, substance, and texture of the hair on the skin of the forehead attached to the horns exactly resembles that of the Cabrit or Pronghorn (*Antilocapra americana*, Gray, Cat. Mam. B. M. p. 117); and if it were not for the very peculiar form of these horns, I should have been inclined to regard them as only the de-

formed horns of that animal; but both the horns are alike and have the same peculiarities, which is not usual in malformations; under these circumstances it appears better to regard them provisionally as belonging to a distinct species, to be established or erased from the list as further knowledge may decide.

There can be no doubt of the position of the horns, as a part of the upper surface of the orbit is to be observed, with the remains of the eyelids and eyebrows, at the base of the left horn.

In the Cabrit, or *Antilocapra americana*, the horns are thick, rounded on each edge and produced into a compressed submedian frontal process, which is gradually bent towards the inner side. The tips of the horns are rounded, becoming nearly cylindrical, and are gradually and regularly arched backwards and inwards, with a bluntish extreme end.

The horns of the genus are peculiar for being lined internally with a close velvety coat of short hair, directed towards the tip of the cavity; and the whole outer surface of the horn appears to be formed of agglutinated hair, some separate hairs being seen on the surface.

The peculiarity in the internal structure of the substance of the horns of this genus shows, like the branched external form, a similarity to the horns of the Deer, the hairy horn being the analogue of the deciduous velvet of the Deer and the permanent hairy coat of the Giraffe. The ring of hair round the base of the outer surface is to be observed equally developed in the horn from Lord Derby's collection and in that of the common *Pronghuck*. (Gray, Ann. & Mag. N. Hist. 1856, vol. xvii. p. 424; P. Z. S. Jan. 9, 1855.)

Sivatheridæ.—Frontal bone with a central conical horn, and two lateral horns over the orbit, which is dilated and branched on the inner side; nasal opening very large, like Elk. (Murie, Geol. Mag. 1871, vol. viii. p. 438.)

Sivatherium giganteum, restored, Murie, *l. c.* t. 12 and 13.

Suborder III. DEVEXA.

Front of upper jaw callous, toothless. Horns far behind the orbits, permanent, on the coronal suture, between the frontal and parietal bones, covered with a permanent hairy skin, ending in a tuft of hairs. False hoofs none; intermaxillaries moderate, reaching to the nasals.

Devexa, *Illiger*, *Prod.* p. 104.
Giraffina, *Gray*, *Cat. Ungulata*, p. 180.

The horn (*dermoceras*) is covered with a skin like the rest of the body and equally permanent, and with hair that is shed and renewed like the hair of the body, and ends in a tuft of hair. The false hoofs wanting. The intermaxillary bones of the skull moderate, reaching to the nasal. Muzzle hairy; lips rather elongate, very flexible; tongue very long, prehensile.

Fam. 17. GIRAFFIDÆ.

Giraffina, *Gray, Cat. Ungul. B. M.* p. 180.
Giraffidæ, *Gray, Lond. Med. Repos.* 1821, xv. p. 307; *Ann. & Mag. N. H.* 1866, xviii. p. 326.
Camelopardalidæ, *Sclater, Ann. & Mag. N. H.* 1866, xviii. p. 403.

1. GIRAFFA.

Lips not grooved, entirely covered with hair, much produced before the nostril, prehensile. Tongue very extensile. Neck very long. Body short. Hind legs short; false hoofs none. Tail elongate, with a tuft of thick hairs at the end.

Africa. Living on leaves of trees and shrubs, in herds. (Brisson, R. A. i. 37, 1763; Gray, Cat. Ung. B. M. 180, t. 23. f. 1, 2, skull.)

Camelopardalis, *Ray, Syn.* 90.

1. **Giraffa camelopardalis.** (The Giraffe or Camelopard.) B.M.

Giraffa camelopardalis, *Gray, Cat. Ungul. B. M.* p. 180, t. 23. f. 1, 2 (skull).

Hab. Africa, North, South, and Central.

Suborder IV. CAPREOLI.

Front of upper jaw callous, toothless. Horns placed behind the orbit, deciduous, covered when young with a deciduous hairy skin, often wanting in the female sex, sometimes in both sexes. False hoofs distinct.

Capreoli, *Illiger, Prod.* p. 104.
Ungulata, Subfamily II., *Gray, Cat. Ungul. B. M.*, p. 182.

The males (and sometimes the females) are periodically furnished with horns from the frontal bones, which, during development or expansion, are covered with a vascular skin coated with down, the skin falling off when the horns are perfect and solid, and the horns themselves falling off at the end of the season. In some few the horns arise from the end of a permanent elongated bony process, as in the Muntjac.

The antlers (*epochocerata*) of the deer differ from the horns of other ruminants in being periodical developments of bone, which is at first covered with a hairy skin, that dries up and falls off. (Gray, Ann. & Mag. Nat. Hist. 1866, xviii. p. 326.)

† *Horns deciduous, often wanting in the female. Tarsi hairy on the hinder side.*—Cervina, *Gray, Cat. Ungul. B. M.* p. 182; Cervidæ, *Baird, Mam. N. A.* p. 628.

Fam. 18. ALCADÆ. (The Elks.)

Nose very broad, truncated, entirely covered with hair, with only a very small central muffle. Young not spotted. Horns expanded or palmated. Skull: nose-hole very large, nasal very short. Arctic Regions.

Deer of the Snowy Regions, *Gray, Cat. Ungul. B. M.* p. 186.
Alcine Deer (Alceæ), *Gray, Cat. Ungul. B. M.* p. 186.

1. ALCES.

Horns without an anterior basal snag, palmated. (Gray, Cat. Ungul. B. M. p. 186, t. 26. f. 1, t. 27. f. 1, head and horns; Baird, Mam. N. A. p. 629; Blasius, Säugeth. Deutsch. p. 434.)

1. Alces malchis. (The Elk or Moose.) B.M.

Alces malchis, *Gray, Cat. Ungul. B. M.* p. 187, t. 26. f. 1, t. 27. f. 1 (skull and horns).
Alces americanus, *Jardine*; *Baird, Mam. N. A.* p. 631, f. 817 & 832.
Alces lobatus, *Agassiz.*
Alces palmatus, *Blasius, Säugeth. Deutsch.* p. 434, f. 231, 232 (series of horns).

Hab. Northern regions of Europe and America.

Fam. 19. RANGIFERIDÆ. (The Reindeer.)

Nose broad, entirely hairy, without any naked muffle. Antler with a large anterior basal snag on the crown, palmated at the end. Skull: nose-hole moderate; intermaxillaries slender, just reaching the nasals. Young not spotted. Arctic Regions.

Rangerine Deer, *Gray, Cat. Ungul. B. M.* p. 188.
Rangiferinidæ, *Brooks.*

1. TARANDUS.

Tarandus, *Gray, Cat. Ungul. B. M.* p. 188, t. 26. f. 2, 3, t. 27. f. 2 (skull and horns).

1. Tarandus rangifer. (The Caribou or Reindeer.) B.M.

Tarandus rangifer, *Gray, Cat. Ungul. B. M.* p. 189, t. 26. f. 2, 3, t. 27. f. 1 (skull and horns).

Rangifer caribou, *Audubon & Bach. N. A. Q.* vol. iii. p. 111, t. 2; *Baird, Mam. N. A.* p. 633 (fig. horns).
Rangifer grœnlandicus, *Baird, Mam. N. A.* p. 634, fig. (horns).
Tarandus arcticus, *Baird.*
Tarandus sylvestris, *Baird.*
Cervus hastalis, *Agassiz.*
Tarandus hastalis, *Baird.*

Hab. Northern regions of Europe and America.

Fam. 20. CERVIDÆ.

Nose tapering, with a well-developed moist, naked muffle. Face without any glandular streak up the front. Crumen distinct, generally well developed. Antlers well developed. Tail distinct. Skull with a moderate nose-hole; intermaxillaries generally reaching the nasals; suborbital pit distinct; canines small, rudimentary. Fur of young spotted; the spots often disappear with age, or are only apparent in adults when the animals are in high condition and have their short bright summer fur.

Deer of Temperate and Warm Regions, *Gray, Cat. Ungul. B. M.* p. 193.

1. *Metatarsal gland distinct, above the middle of the outside of the shank-bone or metatarsus.* Eastern Hemisphere.

The genera fall in the following order, according to the form of the tail:—

1. *Tail very short or clubbed.*		2. *Tail elongate, with longer hair at the end.*
Cervus	Antlers elaphine	Pseudaxis. Dama.
Panolia. Recurvus. Rusa.	Antlers rusine	Hyelaphus. Axis.
Capreolus Elaphurus	Antlers capreoline.	

I. Elaphine Deer.—*Antlers with one or two distinct anterior basal snags close to the crown. Muffle broad and shallow, separated from the upper lip by a hairy band, with only a narrow interruption in front. White anal disk distinct.*—Elaphine Deer, *Gray, Cat. Ungul. B. M.* p. 193.

a. *Tail very short or very blunt.*

1. CERVUS.

Antlers round, erect, with an anterior basal snag, a median anterior snag, with the apex divided into two or more branches, according to the age of the animal. Tail short, broad, depressed, generally blunt at the end. (Gray, Cat. Ungul. B. M. p. 193, t. 27. f. 3, t. 28. f. 1.)

* *Hoofs rather broad, semicircular. Pale anal disk very large, extending above the tail. Hair in winter soft. Antlers with one or two basal snags, median and two upper snags on the front side of the beam.* America. STRONGYLOCEROS.

1. **Cervus canadensis.** (The Wapiti, or American Elk.) B.M.

Cervus strongyloceros, *Gray, Knowsley Men.* t. 36 (male, female, and young).
Cervus canadensis, *Gray, Cat. Ungul. B. M.* p. 193; *Baird, Mamm. N. A.* p. 638, f. 9 and 10 (horn and muzzle); *Wolf, Zoological Sketches*, tab. xix.
Elaphus canadensis, *Dekay.*

Hab. North America, from east to west.

** *Hoofs narrow, triangular. Pale anal disk not extending above the tail. Tail moderate. Hair harsh.* Western world. CERVUS.

† *Head short. Tail short, blunt at the end. Median and upper snags in front of the beam.*

2. **Cervus elaphus.** (The Stag.) B.M.

Antlers; basal snags often in pairs: the median and upper snags on the front of the horn, the upper ones generally in pairs.

Cervus elaphus, *Gray, Cat. Ungul. B. M.* p. 195; *Blasius, Säugeth. Deutsch.* p. 139, f. 233–235 (horns).
Cervus corsicanus, *Pucheran, Archives du Mus.* vol. vi. p. 81 & p. 488, t. 23. f. 10 & 13 (horns), t. 26 (animal).

Hab. Europe and North Africa, Assyria, North-west Asia, Amurland?

†† *Head short. Upper snags of the horns on the hinder side of the beam.*

3. **Cervus barbarus.** (The Barbary Deer.) B.M.

Antlers with basal and median snags on the front of the horn, subterminal snag on the inner hinder margin.

Cervus barbarus, *Gray, Cat. Ungul. B. M.* p. 197; *Knowsley Menag.* t. 37 (male, female, and young).

Hab. North Africa: Barbary, Tunis, Atlas Mountains.

4. **Cervus cashmeerianus.** (Hungal or Kashmir Stag.) B.M.

Head short. Upper surface of the tail dark brown. Anal disk moderate, black-edged. Basal snag double; median snag in front of horn; subapical snag on hinder side of beam.

Cervus casperianus, *Gray, Cat. Osteol.* p. 147; *Cat. Ungul. B. M.* t. 27. f. 1, 3 (skull and horns).
Cervus cashmeerianus, *Falconer, Pal. Mem.* i. p. 576, f.; *Sclater, Trans. Z. S.* vii. p. 339.
Cervus Wallichii, *Blyth, P. Z. S.* 1840, p. 79; *Gray, Cat. Bones B. M.* p. 258; *Knowsley Menag.* p. 160; *Cat. Ungul.* p. 197; *Jerdon, Mamm. India*, p. 250; *Kinloch, Thibet and North India*, p. 44.
Kashmir Stag, *Blyth, Journ. A. S. B.* x. p. 747.

Cervus cashmerensis, *Falconer's MS.*; *Gray, Cat. Ost. Spec. B.M.*
The Shu or Thibetan Stag, *Cunningham, Ladakh*, 1854, p. 201.
Cervus cashmeriensis, *Adams, P. Z. S.* 1858.
Cervus cashmirensis, *Sclater, List of Vert. Zool. Soc.* 1866, p. 47.

Hab. Cashmere.

"*Cervus nariyanus*, Hodgson, J. A. S. B. xx. p. 393, t. 8, said to come from Gnari or Western Thibet, is probably the same animal."—*Sclater.*

Dr. Falconer presented the horns with a label *C. casperianus* in his own handwriting. He afterwards objected to this name, and said he had always called it *Cervus cashmeeriensis*; and now we are informed it is always called *C. cashmeerianus*. See Falconer's 'Memoirs.'

5. Cervus affinis. B.M.

Basal snag often double; median snag on front and upper or hinder side of beam.

Cervus Wallichii, *Cuvier, Oss. Foss.* iv. p. 504; *F. Cuv. Mamm. Lithog.* p. 356.
Cervus affinis, *Hodgson, Journ. A. S. B.* x. p. 721; *Gray, Cat. Ungul. B. M.* p. 199; *Jerdon, Ind. Mamm.* p. 251.
Cervus thibetanus *and* C. elaphus, *Hodgson.*
Shou, *Hooker's Himalaya Journ.* ii. p. 110.

Hab. Sikkim, in Choombi Valley (*Dr. Campbell*).

a. Stag from Pekin, allied to *C. elaphus*, Leadbeater, P. Z. S. 1861, p. 368. *Cervus xanthopygus*, A. Milne-Edwards, Ann. Sc. Nat. Zool. viii. p. 376; Rech. des Mamm. t. 21; Sclater, Trans. Z. S. vii. p. 342. *Hab.* Pekin (domesticated). Head elongate; fur greyish; anal disk large.

††† *Head elongate, narrow, pointed. Tail rather longer, acute at the end.*

6. Cervus maral. (The Maral.) B.M.

Antlers slender, with two basal anterior snags; median snag on the front, and subterminal snag on the inner side of the hinder part of the beam. Tail white above; anal disk large, black on the sides.

Cervus elaphus, *Pallas, Zoogr. Ross.-Asiat.* i. p. 216.
Maral, *M'Neill, P. Z. S.* 1840, p. 11.
Cervus maral, *Ogilby, Rep. Zool. Soc.* 1840, p. 22; *Gray, Knowsley Menag.* t. 40, 50; *Sclater, Wolf's Zool. Sketches*, ii. t. 12; *Trans. Z. S.* vii. p. 336, t. 19, p. 338, f. 4.
Cervus Wallichii, *Gray, Cat. Ungul. B. M.* p. 197.

Hab. Circassia, Persia (*M'Neill*); coasts of Black Sea; Caucasus; Armenia; North Persia.

Cervus Wallichii was established by Cuvier from a copy of General Hardwicke's drawings sent by M. Duvaucel, and published in Cuvier's

'Mammifères,' t. 356, from an animal obtained in Nepal. Mr. Blyth thinks it may be the Hungal (*Cervus cashmirensis*), and Dr. Jerdon the Shou (*Cervus affinis*); but in either case it cannot be the Caucasian Deer.

a. *Cervus cameloides*, A. Milne-Edwards, Ann. Sci. Nat. 1867, vii. p. 377. *Hab.* Mandshuria. Not described.

b. *Tail elongate, acute at the end.*

2. PSEUDAXIS.

Antlers round, erect, with an anterior basal snag, a median on the front, and a snag above it on the hinder side of the beam. Tail elongate, tapering, with longer hair at the tip. Fur spotted; anal disk white, with black cross band at base of tail.

1. Pseudaxis taivanus. (Formosan Axis.) B.M.

Fur pale yellowish brown, white-spotted; rump and upperside of tail black.

Cervus axis, *Cantor, Ann. & Mag. N. H.* 1842, p. 174.
Cervus pseudaxis, *Eydoux & Souleyet, Voy. Bonite*, p. 64, t. 3; *Pucheran, Arch. du Mus.* vi. p. 416, and 489, t. 24. f. 2, 8 (horns); *Swinhoe, P. Z. S.* 1870, p. 644, 1871, p. 237.
Axis pseudaxis, *Gray, Cat. Ungul. B. M.* p. 214.
Cervus taiouanus, *Blyth, J. A. S. B.* xxix. p. 90; *P. Z. S.* 1861.
Cervus taëvanus, *Sclater, P. Z. S.* 1860, p. 376, 1862, p. 152, t. 16 *Trans. Z. S.* vii. p. 345; *Wolf's Zool. Sketch.* ii. t. 14.
Cervus taivanus, *Blyth, Cat.* p. 148; *Sclater, Trans. Zool. Soc.* vii. t. 33, 34.

Hab. Formosa (*Swinhoe*).

Pucheran says these animals are obtained from Java and the Sunda Islands; but most probably they were carried there. He says the mule of *C. axis* and *pseudaxis* is said to be fertile.

"Mr. Swinhoe sent an adult male and female and a younger animal, which were shot in the gardens of the Summer Palace at Pekin in the winter of 1860.

"The male agrees in most particulars with the account of the *Cervus pseudaxis* of Eydoux, figured by Gervais in the 'Voyage of the Bonite,' and its horns with those of the same animal figured by Dr. Pucheran in the 'Archives du Muséum' (vol. iv. t. 24. f. 2–8). The specimens having been procured in the winter, agree with the figures of the animal in that state on M. Gervais's plate. Mr. Swinhoe thought it might be the *Cervus Wallichii* of Cuvier; but it has no affinity to that species." (Gray, Ann. & Mag. N. H. 1861, viii. p. 338.)

The animal which has been figured under the name of *Cervus pseudaxis* was obtained by MM. Eydoux and Souleyet in Java, but they did not believe that it was a native of that country. It lived several years in the Jardin des Plantes at Paris, and hence a series of its horns was procured and figured; and while there it bred with

the common Axis, and the male produce was fertile (see 'Archives du Muséum,' iv. p. 421). Some naturalists have given the Sooloo Islands, near the Philippines, as the habitat of this specimen, but I do not know on what authority.

The Formosan animal seems also to be much more spotted in the winter season than its Japanese ally (*Rusa japonica*), which nearly lost its spots in the Zoological Gardens during the winter of last year.

The old male is furnished with a kind of mane; that is to say, the hair of the neck is longer and more rigid than that of the rest of the body, except just over the tail, where it is also elongated and rigid. The fur of all the three specimens is long and very close, much more so than in its Japanese ally. The male is rather paler in colour and less spotted than either of the hornless specimens; it has only an indistinct, rather darker line of rather longer hair between the withers; and it has a large blackish space of rigid, rather longer hair over the base of the tail. On the other hand, both the hornless skins have a distinct, well-marked black dorsal streak, which is wider, more distinct, and formed of longer hair on the back of the neck; and they have only a broad, well-marked black edge on the upper surface and side of the white anal disk. The tail in all the specimens is white, with a black streak along the middle of the upperside of the base. In this respect it also agrees with *R. japonica*.

I may state that the distinctions of this species of Stags are very difficult to describe by words; yet the allied Deer from different countries are generally to be best distinguished by their size and habitat; and that may be the case with this and the other small *Rusæ* which are described as coming from Timor, the Philippines, and Formosa.

The two skulls which accompanied the skins present a considerable difference in the form and depth of the preorbital pit: and this observation is of some importance, as the size, form, and depth of this pit has been regarded by some zoologists as presenting a good specific distinction; but I have observed a similar difference in skulls of apparently the same species of the genus *Cariacus*. The skulls are not of the same age; but I do not think that this can have any effect on the form or depth of the pit. The skull of the male is of a young animal, the hinder grinder being in the course of development; and the horns are simple, without any snags, like the horn figured in 'Arch. du Mus.' vi. t. 24. f. 2, but even wanting the basal snag, and they are covered with hair. In this skull the preorbital pit is large, subtrigonal, and not quite so deep as it is wide, rounded at the base.

The skull of the female is rather larger, and belongs to an adult animal, with all the grinders well developed. In this skull the pit is oblong, not so broad as long, and very much deeper (I should say, nearly twice as deep), and has a large aperture at the hinder part of its base, evidently for the transmission of some vessel, which is not to be seen in the skull of the male.

The male skull has short canines, not produced beyond the surface of the bone; the female has the holes of smaller canines which have fallen out.

2. Pseudaxis mantchurica. B.M.

Dark brown; rump and upper part of tail black; paler and white-spotted in summer.

Cervus Wallichii, *Swinhoe, P. Z. S.* 1861, p. 134.
Cervus pseudaxis, *Gray, P. Z. S.* 1861, p. 236, t. 27.
Cervus hortulorum, *Swinhoe, P. Z. S.* 1864, p. 168.
Cervus mantchuricus, *Swinhoe, P. Z. S.* 1864, p. 721, 1865, p. 1; *Sclater, P. Z. S.* 1864, p. 721; *Trans. Z. S.* vii. p. 344, t. 31, 32; *Wolf's Zool. Sketches*, ii. t. 13.

Hab. Northern China, the Emperor's Park, Pekin (*Swinhoe*). B.M.

3. Pseudaxis sika. B.M.

Yellowish brown, white-spotted. Dorsal disk and tail white, black-edged. Horns subrusine, but more slender. Gland on tarsus encircled with white.

Rusa japonica, *Gray, Ann. & Mag. N. H.* 1861, iii. p. 218.
Cervus pseudaxis, *Gray, P. Z. S.* 1861, p. 236, t. 27.
Cervus sika, *Temminck, Fauna Japonica*, p. 54, tab. 17; *Gray, Cat. Ungul. B. M.* p. 200; *Ann. & Mag. N. H.* 1861, vol. viii. p. 338; *Wolf's Zool. Sketch.* ii. t. 15; *Sclater, Trans. Zool. Soc.* vii. p. 346, t. 35.
Rusa javanica, *Sclater, P. Z. S.* 1860, p. 376 (as a mistake for *japonica*).

Hab. Japan.

Very like a series of animals (for now we have two pairs, and they are breeding) which were received a short time ago by the Zoological Society from Japan, and which I described, under the name of *Rusa japonica*, in the 'Annals and Magazine of Natural History,' for February 1861, p. 143; and in the form of the horns and in the general appearance of the animal it agrees with the *Cervus sika*, Temminck, very briefly described and figured in the 'Fauna Japonica.'

Dr. Sclater, in the 'Proceedings of the Zoological Society,' has stated his opinion that my *Rusa japonica* is probably the same as *Cervus sika*, and also as *Cervus pseudaxis*. But *Cervus pseudaxis* and *Rusa japonica* differ from *Cervus sika* in having a large white anal disk surrounded by a black edge, which is not represented in the figure of *Cervus sika*, nor mentioned in the short and, I own, very imperfect description of that species. (Gray, Ann. & Mag. N. H. 1861, viii. p. 338.)

I believe that Dr. Sclater is now satisfied that the identity of my *Rusa japonica* with *Cervus sika* is very doubtful. Indeed I cannot conceive how this can be otherwise, unless the *Cervus sika* is very badly figured and incorrectly described. We may therefore regard *Cervus sika* as a distinct species, at least until we can procure some

further observations on it. It was figured and described from a single male specimen sent to Leyden.

The specimens from Northern China sent by Mr. Swinhoe (which I am inclined to think may be *Cervus pseudaxis* of Eydoux) chiefly differ from *Rusa japonica* in being of a considerably larger size, the Chinese species being as large as the Fallow Deer, and the Japanese *Rusa* considerably less—between that animal and the Roebuck.

"Dr. Gray has described these animals, believing them to be new, in a recent number of the 'Annals of Natural History,' as *Rusa javanica* (Ann. N. H. ser. iii. vol. vi. p. 218, Sept. 1860). But on reference to the figure of *Cervus pseudaxis* of MM. Eydoux and Souleyet in the 'Zoology of the Voyage of the Bonite' (Atlas, pl. 3. Zool. p. 64), and to further details concerning the same animal given by Dr. Pucheran in the 'Archives du Muséum d'Hist. Nat.' (vi. pp. 416, 489), it seems probable that our new acquisition may belong to the same species. The locality of the example figured in the 'Voyage of the Bonite' was not ascertained; but a second specimen, brought home by the expedition of the 'Astrolabe and Zelée,' was said to have come from the Sooloo Islands. This discrepancy of localities is a fact which would lead me to believe that our animals are different from *Cervus pseudaxis*; but in the structure of the horns, in the general colouring of the body, in the elongation of the hairs of the mane and throat, and in the disappearance of the white spots in winter, our specimens seem to me to agree well with the peculiarities indicated by the French authorities; and the male possesses partially developed canines, which are likewise spoken of in the case of *Cervus pseudaxis*.

"Mr. Blyth has also recently described a Deer from the island of Formosa, under the name *Cervus taiouanus* (Journ. As. Soc. Beng. xxx. p. 90), which is probably likewise referable to this same species. At the time of writing this description, Mr. Blyth was inclined to consider the Formosan animal different from a pair of the small Deer of Japan, which he had living with him in Calcutta at the same date. This opinion, however, he has subsequently modified, stating, in a letter, addressed to me, dated July 4th of the present year, with reference to the Formosan and Japanese Deer, which he had then turned out together in his garden at Calcutta, that he was 'satisfied that they were of one and the same species.'

"My opinion therefore is—though I do not state it without hesitation, against so high an authority on the subject of the *Cervidæ* as Dr. Gray—that *Rusa javanica* is probably a synonym of *Cervus pseudaxis*, Eydoux and Souleyet, and *Cervus taiouanus*, Blyth. But there is, perhaps, a still older appellation for this little Deer. The figure of Temminck and Siebold's *Cervus sika*, in the 'Fauna Japonica,' certainly looks very little like the male of this species. The uniform colouring and the third branch to the horns are very noticeable points in which it differs from our male Deer. To the description given in the same work I have unfortunately had no access, the sheets containing it being deficient in the only copy I have been

able to consult. But Mr. Bartlett, who has lately returned from Holland, informs me that a female Deer living in the Gardens at Amsterdam, and there considered as *Cervus sika*, is undoubtedly the same as ours; and as the Dutch naturalists have consulted the type in the Leyden Museum, there appears to be little doubt of the fact. I am therefore induced to believe that the following may prove to be the correct synonymy of this species of Deer:—

"Cervus sika, *Temm. & Sieb. Fauna Japonica, Mamm.* pl. (fig. mala).
Cervus pseudaxis, *Eyd. & Soul. Voy. Bonite, Zool.* p. 64, pl. 3; *Puch. Arch. Mus. Par.* vi. pp. 416, 489; *Wagn. Suppl. Schreber's Säug.* v. p. 364 (?).
Cervus axis, ex China, *Cantor, Ann. N. H.* ix. p. 274.
Cervus taiouanus, *Blyth, J. A. S. B.* xxix. p. 90.
Rusa javanica, *J. E. Gray, Ann. N. H.* ser. 3. vi. p. 218.

"Mr. Blyth, it may be remarked, is of opinion (J. A. S. B. xxix. p. 90) that this Deer 'belongs strictly to the *Elaphine*, and not to the *Axine* group,' and states that its skull 'has the same large round infraorbital foramina as *C. elaphus* and its immediate congeners.'"—*Sclater, P. Z. S.* 1860, pp. 375–377.

"The figure of *Cervus sika* in the 'Fauna Japonica' appears to be intended for this animal in winter dress, in which the spotting is almost obsolete, although in our animals it never quite disappears. The accompanying plate (xxxv.) represents this Deer in its summer dress. The figure in the 'Fauna Japonica' is also incorrect in not showing the conspicuous white of the anal region, which is nearly as evident in winter as in summer."—*Sclater, Trans. Z. S.* vii.

Dr. Schlegel, the Director of the Leyden Museum, has, in reply to an application from me, sent me this day (July 11, 1861) the following note on the specimen of *C. sika* in the Leyden collection:—
"If you mean by the anal disk the whitish or yellowish disk which extends in the Common or Canada Stag above the tail, the Japanese Stag decidedly shows nothing of this kind. In this species the white colour is restricted to the abdomen, the inside of the thighs, the anal region, and the greater end part of the tail: the root of the tail is, on the contrary, of the same brown colour as the whole back and the rest of the animal." (Gray, Ann. & Mag. N. H. viii. 1861, p. 338.)

Dr. Sclater specially says that the white anal mark is distinct at all seasons in *A. japonica*.

3. DAMA.

Antlers rounded below, expanded above, smooth and branched on the hinder edge. Tail elongate, compressed, ending in a pencil of hair. Crumen well developed. Fur close, adpressed. (Gray, Cat. Mamm. p. 200, t. 28. f. 2, 3, t. 30. f. 1; Blasius, Säugeth. Deutsch. f. 237.)

1. Dama vulgaris. (The Fallow Deer.) B.M.

Dama vulgaris, *Gray, Cat. Ungul. B. M.* p. 200.
Cervus dama, *Blasius, Säugeth. Deutsch.* p. 453, f. 236, 237.
Cervus mauricus, *F. Cuvier, N. Bullet. Soc. Phil.* p. 72, 1816.

Hab. Persia. Domesticated in Europe and America.

Introduced and domesticated in the island of Barbuda, Antigua, about a hundred or a hundred and fifty years. Mr. Darwin has sent to the Museum three flat skins (two of the usual and one of the black variety) from this locality.

II. RUSINE DEER or SAMBOO.—*Antlers subcylindrical, with a distinct anterior basal branch close on the burr or crown, without any median branch, and with a rather elongated peduncle. Muffle large, high, not separated from the upper lip by a hairy band. Skull with a very deep suborbital pit.* South-eastern Asia and its islands.—Rusine Deer, *Gray, Cat. Ungul. B. M.* p. 202.

* *Antlers variously branched above. Tail bushy at the end.*

4. PANOLIA.

Antlers round, curved backwards and outwards, with a large anterior basal snag close on the burr; the upper part bent in, forked, becoming rather expanded and branched at the inner or hinder edge. Tail short, depressed, broad at the end, hairy. (Gray, Cat. Ungul. B. M. p. 202, t. 29. f. 1, 2, t. 30. f. 1, skull and horns.)

1. Panolia Eldii. (The Sungral.) B.M.

Panolia Eldii, *Gray, Cat. Ungul. B. M.* p. 202, t. 29. f. 1, 2, t. 30. f. 2 (skull and horns); *Murie, P. Z. S.* 1870, p. 611, f. 1 (horns).
Rusa dimorpha, *Gray, Cat. Ungul. B. M.* p. 209?
Cervus Eldi, *Sclater, Trans. Z. S.* vii. p. 348, t. 37, 38.
Cerf frontal, *Pucheran, Arch. Mus.* vi. tab. 23. fig. 4 (horns).

Hab. India, east of Bengal; Pegu; Troponipore; Malay peninsula; Assam (*Eld*); Hainan.

Mr. Blyth, in 'Land and Water' for 9th March 1867, p. 159, says that *Cervus dimorpha* of Hodgson is only a badly developed specimen of *Panolia Eldii*. Hodgson said it came from the Saul forest. Morung, where I was not aware that species was found. At any rate, it is only a young specimen, with imperfectly developed horns.

2. Panolia platycercus. B.M.

Horns dilated at the tip, and the branches are all on the inner side.

Panolia platyceros, *Gray, Cat. Ungul. B. M.* p. 203.

Hab. Siam.

5. RUCERVUS.

Antlers cylindrical, with an anterior basal branch, and median and several superior snags on the hinder side. No anal disk. Muffle large, high, continued to the edge of the upper lip below. Tail rather short, thick, broad, and truncated at the end. Face shortish. (Gray, Cat. Ungul. B. M. p. 203, t. 29. f. 3, 4.)

1. Rucervus Duvaucellii. (The Bahrainga.) B.M.

Beam of horn elongate.

Rucervus Duvaucellii, *Gray, Cat. Ungul. B. M.* p. 203, t. 29. f. 3, 4, t. 30. f. 3; *Knowsley Menag.* pls. 41 & 42; *Jerdon, Mamm. India.*
Cervus euceros, *Gray, Knowsley Menag.* pp. 40, 41.

Hab. India: Nepal, large rivers of Bengal to Assam, and great forest-tracts of Central India.

M. Milne-Edwards doubts if this animal is the *Duvaucellii* of Cuvier, from three horns sent by Duvaucel. If this is correct, it should be called *Rucervus elaphoides.*

2. Rucervus cambojensis. B.M.

Beam of horn very short, not larger than the main beam of each fork.

Cervulus cambojensis, *Gray, P. Z. S.* 1861, p. 138.
Cervus Schomburgkii, *Blyth, P. Z. S.* 1863, p. 155, fig. (horns), 1867, p. 836, fig. (horns).

Hab. Siam.

On re-examination I am inclined to believe that the forehead and horns brought by M. Mouhot from Cambojia, and named *Cervulus cambojensis*, are only irregularly developed horns of this species. The horns are short, thick, nearly straight, with a short, thick, recurved branch on the outer part of the front side near the base; and on one of them there is a somewhat similar callosity on the hinder side at the same level.

** *The upper part of the antlers simply forked. Tail bushy at the end.*

6. RUSA.

Tail moderate, broad, depressed, rounded at the end. Antlers placed on a moderately long peduncle, with an anterior frontal snag close on the crown, and simply forked at the tip. Fur formed of hard, rigid, very thick hair, not or only obscurely spotted. Crumen very large. Males generally with elongated hair on the neck. (Gray, Cat. Ungul. B. M. p. 205, t. 30. f. 4, t. 31. f. 1, 2.)

† *The upper snag in front of the beam.*

1. Rusa aristotelis. (The Sambăr.) B.M.

Large; horns stout.

Rusa aristotelis, *Gray, Cat. Ungul. B. M.* p. 205.
Cervus aristotelis, *Pucheran, Arch. du Muséum*, vi. t. 29 (animal), t. 20. f. 9 & 10, t. 21; *Sclater, Trans. Z. S.* vii. p. 350, f. 7, 8 (head and horns).

Hab. India, Southern.

2. Rusa hippelaphus. (The Mijangan Banjoe.)

Large; blackish brown. Neck maned. Horns elongate, slender, very granular; upper snag generally long, and beam generally much produced beyond it.

Rusa hippelaphus, *Gray, Cat. Ungul. B. M.* p. 209.
Cervus hippelaphus, *Pucheran, Archives du Muséum*, vi. t. 24. f. 1 (horns); *Schreber, Suppl.* ii. t. 250 *a*?
Cervus rusa, *S. Müll. Verh.* t. 43 (animal), t. 45. f. 1–4 (horns & skull).

Hab. Java.

The larger Axis, Pennant's Quadrupeds, no. 58 (Cuvier, Oss. Foss. iv. p. 40; *Axis Pennantii*, List Mamm. B. M. p. 180, from a horn in the British Museum), appears to be only a very thick variety of this species, which is peculiar for having very large tubercles on the surface.

3. Rusa moluccensis. B.M.

Antlers elongate; upper snag in front of the beam. Tail elongate. Fur harsh.

Cervus moluccensis, *Quoy & Gaimard.*
Cervus (Rusa) moluccensis, *S. Müller, Verh.* t. 45. f. 5.
Rusa moluccensis, *Gray, Knowsley Menag.* t. 43.
Cervus hippelaphus, var., *Gray, Cat. Ungul.* p. 209.

Hab. Java (B.M.); Batchian (B.M.).

†† *The upper snag placed on the inner part of the hinder side of the beam of the horn.*

4. Rusa equinus. (The Sambăr.) B.M.

Large; blackish brown; rump brownish.

Rusa equinus, *Gray, Cat. Ungul. B. M.* p. 210, t. 34, t. 31. f. 1, 2 (skull and horns); *Sclater, P. Z. S.* 1863, p. 224.
Cervus equinus, *S. Müller, Verh.* t. 42 (animal), t. 45. f. 7–11 (horns and skull).

Hab. Sumatra; Borneo; Assam (B.M.).

The Assam skull in the British Museum is 14½ inches long. Readily distinguished from the *Rusa* from Java by its darker colour, shorter hair, and stouter antlers.

a. *Rusa paradoxa* (Brehm, Bilder u. Skizzen, p. 18, with a woodcut), from the Mascarene Islands, and probably identical with the *C. rufus*, stated by Blyth to have been introduced into the Mauritius from Java.

5. Rusa Swinhoii. (The Cheeang.) B.M.

Cervus Swinhoii, *Sclater, P. Z. S.* 1862, p. 152, t. 17; *Trans. Z. S.* vii. p. 349, f. 6 (head), t. 39 (animal); *Wolf's Zool. Sketches*, ii. t. 17; *Swinhoe, P. Z. S.* 1870, p. 644, f. 5 (horns).
Cheeang, *Swinhoe, P. Z. S.* 1862, p. 364.

Hab. Formosa.

"As regards the affinities of this species, it is unquestionably nearly allied to the *Cervus equinus* of Sumatra and Borneo (of Müller, Verhand. Zool. p. 212, tab. 42); and I do not pretend to be able to point out the differences between those two Deer, as we have never had adult specimens of the latter. But the Formosan form of Rusa is certainly, in my opinion, quite distinct from the true Sambur of continental India (*C. aristotelis*), which Mr. Blyth now seeks to unite with *C. equinus*. The true Sambur is a larger and more lightly and uniformly coloured animal, and attains much larger and better-developed horns than *C. Swinhoii*, which is further remarkable for the rufous colour of its hinder quarters and its black and very thick and bushy tail."—*Sclater*.

6. Rusa mariannus. B.M.

Cervus mariannus, *Desm. Mamm.* 1820, p. 436; *Cuv. Oss. Foss.* 1825, iv. p. 45, pl. 5. figs. 30, 37, 38, 46; *H. Smith, Griff. Anim. King.* 1827, iv. p. 115; *Sundevall, Pecora*, p. 57; *Gray, P. Z. S.* 1850, p. 232; *Fraser, P. Z. S.* 1864, p. 369 (fig. horns); *Sclater, P. Z. S.* 1870, p. 279.

Cerf des Iles Mariannes, *Quoy & Gaim. Voy. de l'Uranie, Zoologie*, 1824, p. 33.

Rusa philippinus and var., *Gray, Cat. Ungul.* p. 211.

Cervus philippinus, *Pucheran, Arch. du Mus.* 1847, vii. p. 49.

Hab. Philippine Islands; Manilla (*Cuming*). Common, naturalized in island of Guan (*Quoy*).

Fur, or hair, and tail like the Sambur; shorter and more bushy than the tail of *Axis*.

Horns short, thick, largely granular, the upper snag on the inner part of the hinder side.

a. Skull—length $10\frac{1}{2}$ inches; width at orbits $4\frac{5}{8}$ inches; nose-hole short. A second skull with thicker horns—length $11\frac{1}{2}$ inches, width at orbits $4\frac{1}{2}$ inches.

"The Rusine form of Deer of the Philippines was still very imperfectly known. The present animal was of small size, about equalling that of the Hog-deer (*C. porcinus*), but more slender in form. It was very dark in colour, being of a nearly uniform dark brown; the ears short and rather rounded, apparently naked on the outside. Round the eye was a pale mark; the tail beneath and inside of thighs were white; and the white metatarsal gland-patches were very prominent."—*Sclater, P. Z. S.* 1870, p. 279.

7. Rusa Peronii. (The Smaller Rusa.) B.M.

Brown; belly reddish, paler; inside of hind legs and buttocks white. Tail rather elongate. Hair of head and neck short.

Rusa Peronii, *Gray, Cat. Ungul. B. M.* p. 211.

Cervus (Rusa) timorensis, *Müller, Verh.* t. 45. f. 6; *Sclater, List Vert. Anim. Zool. Soc.* 1867, p. 48.

Hab. Timor; Lomboc; Ternate.

M. Pucheran states that F. Cuvier's statement as to the occurrence of this species in Timor is erroneous, and that the typical specimen was obtained on the Indian continent (Rev. et Mag. Zool. xvi. p. 376).

In the Zoological Gardens, where this and the preceding animals are alive, they are regarded as distinct; and our specimens chiefly come from there.

8. **Rusa Kuhlii.** (The Timor Rusa.) B.M.

Small. Pale brown; hairs harsh. Horns small, slender, with the subapical snag on the inner hinder edge of the beam.

Rusa Kuhlii, *Gray*, *P. Z. S.* 1850.
Cervus Kuhlii, *S. Müller*, *Verhandl.* t. 44, 45. f. 12–14 (skull and horns); *Selater*, *List Vert. Anim. Zool. Gard.* 1867, p. 48.
Rusa Peronii (part.), *Gray*, *Cat. Ungul.* p. 211.

Hab. Timor. From the Leyden Museum.

Cervus Kuhlii "resembles in size and general appearance *C. porcinus* of India, but is absolutely without spots, even in the youngest age." From the Bavian Islands. Breeds freely in the Amsterdam gardens. (Sclater, P. Z. S. 1863, p. 224.)

a. *Rusa lepida*, Gray, Cat. Ungul. B. M. p. 212. *Hab.* Java?

**** Upper part of antlers simply forked. Tail tapering at the end, rather elongate.*

7. HYELAPHUS.

Tail rather elongate, covered with hair, acute at the end. Antlers on an elongated hairy pedestal; upper snag on inner hinder edge of the beam. Ears short and rounded. Fur moderately thick, polished palish hair, fulvous and spotted in summer. Legs rather short, the front being rather the shortest. Face short, broad, arched in front.

Hyelaphus, *Gray*, *Cat. Ungul. B. M.* p. 215, t. 30. f. 1, t. 34. f. 4 (head and horns).

1. **Hyelaphus porcinus.** (The Lugna Para or Shooriah.) B.M.

Hyelaphus porcinus, *Gray*, *Cat. Ungul. B. M.* p. 215; *Knowsley Menag.* t. 42; *Pucheran*, *Arch. Mus.* vi. tab. 28 (male).
Cervus oryzeus, *Kelaart* (*J. A. S.* xx. p. 174).

Hab. India, plains; Ceylon; Malaya.

8. AXIS.

Tail elongate, rather compressed, covered with long hair above, forming a sharp pencil at the end. Antlers elongate, slender, nearly sessile, arched, with the median snag on the inner hinder side of the beam. Fur formed of thick polished hair, fulvous, and white-

striped and spotted at all seasons. Face elongate, narrow. Ears large, rather elongate and acute.

Axis, *Gray, Cat. Ungul. B. M.* p. 212, t. 31. f. 3, 4, t. 34. f. 1.

1. **Axis maculata.** (The Axis or Chittra.) B.M.

Horns elongate, slightly nodulous; the basal snag arched; the central snag short, on the inner hinder edge of the elongated beam. (Cuv. Oss. Foss. iv. t. 5. f. 24–28 & 29 ?)

Axis maculata, *Gray, Cat. Ungul. B. M.* p. 212.
Cervus porcinus, *Schreber*, t. from *Buffon, Suppl.* iii. t. 28.

Hab. India, plains; Ceylon.

2. **Axis Alfredi.**

"General shape and appearance that of a small *Cervus axis*, but of a nearly uniform dark chocolate-brown colour, darker round the breast; whole sides of the body ornamented with about six rows of not very distinctly marked pale yellowish spots; dorsal line and upper surface of tail not spotted; belly and under surface of limbs and throat pale yellowish brown, or fawn-colour. Head pale brown, darker between the horns; outer surface of ears black, sparingly covered with hair; inner surface of ears rather thickly covered with whitish hairs; orbital sinus large and well developed, and surrounded with blackish hairs. Ears short and small. Muffle naked, wide, and very moist. Chin and upper part of throat pale yellowish white. Gland on metatarsus indicated by a small spot. Height 2 feet 6 inches; length of ear, from opening to tip, $3\frac{1}{4}$ inches; length of tail $3\frac{1}{2}$ inches."—*Sclater.*

Cervus Alfredi, *Sclater, P. Z. S.* 1870, p. 381, t. 28, 1871, p. 237, f. 3.

Hab. Philippine Islands; Malayan peninsula, or adjoining islands (?).

"This animal is most nearly allied to *Cervus axis*, but is at once distinguished by its smaller size, smaller ears, and general colour, which is of a dark chocolate. Under these circumstances I propose to confer upon it a temporary specific name, and to call it after His Royal Highness who has sent it home."—*Sclater.*

Fur and tail like *Axis*, but tail rather shorter. Horns about 5 inches long, with a small subapical posterior snag.

III. Roes.—*Antlers without any anterior basal snag, the first branch being considerably above the burr. Muffle broad and naked. Gland covered with a tuft of hair on the upper outer part of the metatarsus.*—Capreoline Deer, Section A, *Gray, Cat. Ungul. B. M.* p. 221.

9. **CAPREOLUS.**

Tail none; anal disk distinct. Antlers nearly erect; basal snag none; median and upper snags anterior, making the horn repeatedly furcate. Crumen indistinct. Gland and tuft of hair above the middle

of the metatarsus. Fur thick, brittle hair in winter, and more flexible in summer. The end of nose and upper lip and hinder edge of lower lip black; spot under nostrils and front of chin white. (Gray, Cat. Ungul. B. M. p. 221, pl. 33. f. 1; Blasius, Säugeth. Deutsch. p. 463, f. 239.)

1. Capreolus capræa. (The Roebuck.) B.M.

Hair short.

Capreolus capræa, *Gray, Cat. Ungul. B. M.* p. 222, t. 33. f. 1, t. 34. f. 3 (skull).
Capreolus capreolus, *Blasius, Säugeth. Deutsch.* p. 457, f. 238, 239 (horns).

Hab. Europe.

In the Museum is a skin received from the Zoological Society in 1858, without any habitat, of a Roebuck in bright brown summer coat. It has rather deformed horns in the process of development, having the front snag rather nearer the base than usual, and having a strong conical process on the hinder base of the left horn, somewhat like the lobe of *Xenelaphus*.

In the British Museum there is a skull (No. 6880) which has been considered that of a Roebuck with very much deformed horns, which was received from the Museum of the Zoological Society, without any habitat. At first sight the horns have some resemblance to those of *Xenelaphus leucotis*, and, like it, the horns on the two sides are very different; but in *Xenelaphus* the peculiar projection is from the back of the base of the horn, and here it is an extreme development of a snag from the front of the base of the horn, which is three-lobed at the end, two smaller lobes being directed forward and much below the erect tip.

The right horn resembles a much-developed, but rather irregularly divided form of a Roebuck-horn, with very thick and very deep longitudinal grooves, having high ridges and nodulous on the edges, occupying the whole length of the main beam to the burr, just above which they are largest and deepest; and it has on the inner side of the first furcation a thick, short, recurved snag. The left horn is like the other, but much thicker at the base; the recurved snag on the inner side is much longer and more slender; but the usual anterior snag of this furcation is reduced to a very small conical prominence; and what seems to be equivalent to the hinder lower snag of the other horn is a dilated flattened process at the base, divided into two slender unequal lobes at the top; but the great peculiarity of this horn is the existence of a branch springing from the front of the base of the main beam about half as large as the horn itself, and having two conical divergent snags on the front part of the middle of its length. (P. Z. S. 1871, p. 601, fig.)

2. **Capreolus pygargus.** (The Ahu.) B.M.

Hair long.

Capreolus pygargus, *Gray, Cat. Ungul. B. M.* p. 223.

Hab. Central Asia (B. M.); China (*Swinhoe*, B. M.).

10. ELAPHURUS.

Tail elongate, cylindrical, bushy at the end. Antlers cylindrical, with a posterior, elongated, subbasal branch, sometimes divided at the end; an elongated submedian posterior branch, and sometimes some small posterior apical snags. Crumen small; skull with a large suborbital pit. (A. Milne-Edwards, Archives du Muséum, p. 26, t. 4–6, 1866; Trans. Zool. Soc. vii. p. 335, f. 1, 2, skull and horns.)

"The general aspect of the Elaphure is much more like that of the true *Cervi* than I had anticipated from the description and figure of M. Milne-Edwards. The only two very noticeable points of distinction, besides the horns of the male, which are not at present shown in our animals, are the rather larger, heavier legs, the longer and more expanding toes, and the long tail. The latter character, however, seems to me to have been somewhat exaggerated in M. Milne-Edwards's figures—the tail in our specimen not nearly reaching the hocks, and, though of somewhat different form, being little, if any, longer than that of the Fallow Deer and some of the American Deer (such as *Cervus virginianus*)."—*Sclater.*

1. **Elaphurus Davidianus.** (The Mi lou.) B.M.

Elaphurus Davidianus, *A. Milne-Edwards, Nouv. Arch. du Muséum*, ii. *Bull.* p. 26, t. 4–6 (1866); *Ann. Sci. Nat.* 1866, v. p. 380.
Cervus Davidianus, *Sclater, Trans. Z. S.* vii. p. 333, t. 28. p. 335, f. 1, 2.

Hab. North China, Pekin, in parks; perhaps from Thibet.

The young spotted. A skin and skeleton of female in B. M., received from the Zoological Society.

2. *Metatarsal gland distinct, below the middle of the outside of the bone.*

IV. American Roes.—*Antlers with a small subbasal snag on the inner side of the beam, which is bent forward, and is variously branched on the hinder side. Fur soft. Tail hairy beneath.* North or Central America.

11. CARIACUS.

Antlers with the beam curved forwards, and with several branches from its hinder edge; a subbasal snag, some distance from the inside of the base, often wanting. Skull elongate, narrow; suborbital pit small, deep, triangular; intermaxillaries broad, triangular, reaching the nasals. (Gray, Ann. & Mag. N. H. 1866; Cat. Ungul. t. 33. f. 2, 3, skull and horns.)

Cervus, b, *Spencer Baird, Mamm. N. A.* p. 644, f. 11–18 (horns and muffle).

* *Horn elongate; beam much curved forward, having several branches on its upper surface.* (Cuvier, Oss. Foss. iv. t. 5. f. 1-25.) North America.

1. **Cariacus virginianus.** (The American Deer.) B.M.

Fur in summer bright uniform rufous; in winter pale grey chestnut, faintly annulated; chin with a transverse black band; tail white above and below, dark brown above at the tip.

Virginia Deer, *Pennant, Quad.* i. t. 20. f. 2 (horns); *Knowsley Menag.* t. 44. f. 6.
Cariacus virginianus, *Gray, Cat. Ungul. B. M.* p. 228, t. 33. f. 2, 3.
Cervus virginianus, *Baird, Mamm. N. A.* p. 648, f. 12 (horns); *Schreber, Suppl.* v. t. 257 *h*; *Pucheran, Arch. du Mus.* vi. p. 305.
Cariacou, *Buffon, Nat. Hist.* xii. p. 347, t. 44 (female).
Cervus ramosicornis, *Blainville.*

Hab. North America. It is larger in the northern parts and mountain-regions, and gradually becomes smaller as found more south and near the sea-coast.

2. **Cariacus leucurus.** (The Long-tailed Deer.) B.M.

Fur in autumn yellowish grey, clouded with grey, and not lined with dusky; chin entirely white, with a small dusky spot on the edge of the lower lip; anal region, but not buttocks, white; tail reddish above.

Mexican Deer, *Pennant, Quad.* i. t. 20. f. 1 (horns only).
Cariacus leucurus, *Gray, Cat. Ungul. B. M.* p. 230; *Wolf, Zool. Sketches,* i. t. 20.
Cervus leucurus, *Spencer Baird, Mamm. N. A.* p. 659, t. 5. f. 14–18 (horns); *Pucheran, Arch. du Mus.* vi. p. .
Cervus mexicanus, *H. Smith, Cuv. A. K.* iv. t. 163. f. 3 (horns).
Cervus macrurus, *Rafinesque, Am. Mon. Mag.* 1847, i. p. 436; *Ham. Smith,* v. p. 316.

Hab. N. America: Columbia River (*Lord*); Upper Missouri and Upper Platte (*Baird*).

The horns figured by Pennant are in the British Museum, and were refigured by Hamilton Smith; but the name Mexican Deer is scarcely applicable to an animal said not to inhabit that country. The horns figured by H. Smith, under the name of *Cervus clavatus*, iv. t. . f. 4, may belong to this species. It is peculiar for having a large club-shaped process from the underside of each horn; but this is probably an irregularity of growth.

3. **Cariacus similis?**

Cervus similis, *Pucheran, Arch. du Mus.* vi. p. 362, t. 26.
Cervus affinis, *Pucheran, Compt. Rend.* 1849, p. 77, not *Hodgson.*

Hab. Unknown (*Pucheran*).

There are two skulls with horns, purchased of Mr. Cuming, in the British Museum, without any locality, which are very similar; the horns differ considerably from those of *Cariacus virginianus* and

C. leucurus by the beam being shorter, stouter, and ascending so that the tips are much above the base of the horns. They have a long subbasal and two elongated compressed snags on the hinder side. The animal figured by M. Pucheran as *C. similis*, Arch. du Mus. vi. p. 362, t. 26, would probably be very like the horns here referred to when a little more developed.

There is a female American Deer, which the Museum received from the Zoological Society, and which is entered in the Catalogue of their Museum published in 1835, p. 39. no. 354, the Woodland Deer, *C. nemoralis*, H. Smith, from South America, which may be the female of this species. The fur is ashy brown, rather rough, paler beneath; the sides of the head and nose, the upper lip, gullet, and throat white; the upper margin of the muffle and back edge of the nostrils, a spot on each side of the chin dark brown; orbits whitish; tail the same colour above as the back, blackish at the end and white beneath. The hair of the chest is whorled. There is a pair of horns also in the Museum, 681 *v*, without habitat, which probably belong to this species. They differ in the upper part of the beam being much more slender, and in having only one, submedian snag on the upper surface.

** *Horns short, the beam suberect, rather arched forward, with one, rarely two snags on the hinder side of the upper part.* (Cuv. Oss. Foss. iii. t. 5. f. 19–22.) Central or South America.

4. **Cariacus mexicanus.** (Aculliame.) B.M.

Fur brown, punctulated with yellow; forehead and crown blackish, with hair diverging from a central longitudinal line; legs grey; tail same colour as the back above, underside and tip white; upper lip and hinder part of lower lip black; spot on sides of nostrils and lower lip white; upper part of tail like back, margin and tip white; sides of nose and chin brown; a narrow white streak behind the brown on the nose. Male and female from Costa Rica.

Aculliame, *Hernandez.*

Chevrenils d'Amérique, *Daubent. Buffon's H. N.* vi. p. 243, t. 37. f. 1, 2 (horns, good); *Cuvier, Oss. Foss.* iv. p. 36, t. 5. f. 19–22.

Mexican Deer, *Pennant, Quad.* (part. from *Buffon*).

Biche de Savannes, *La Borde, Buffon's H. N. Suppl.* iii. p. 126 (young in winter); *Cuvier, l. c.*

Biche des Paletuviers, *La Borde, Buffon's H. N. Suppl.* iii. p. 126 (adult male); *Cuvier, l. c.*

Cervus mexicanus, *Gmelin, S. N.* i. p. 179 (from *Pennant*); *Schreber,* v. p. 1122; *Wagler, Suppl.* iv. p. 378, t. 351 *a* (very bad); *Lichtenstein, Darstellung,* t. 18; *Baird, Mamm. N. A.* p. 653 (from Sonora).

Cariacou, *Buffon, Daubenton, Hist. Nat.* xii. p. 347, t. 44 (female); *Pucheran, Arch. du Mus.* vi. p. 363 (from Cayenne).

Mazame, *F. Cuvier, Mamm. Lithog.* 1832, t.

Cariacus savannarum, *Cabanis & Schomburgk, Reisen in Brit. Guian.* iii. p. 785; *Gray, Cat. Ungul. B. M.* p. 236 (from Guiana, only slightly indicated).

Cervus spinosus, *Gay & Gervais, Ann. Sci. Nat.* 1846, p. 94 (from

horn of M. Poiteau, from Cayenne), fig.; *Cuvier, Oss. Foss.* iv. t. 5. f. 22 *a*; *Gray, Cat. Ungul. B. M.* p. 236.

Cervus Goudotii, *Gay & Gervais, Ann. Sci. Nat.* 1846, p. 94 (horn from New Granada, lyrate, half the size of those of *C. axis*, and with only a single posterior basal snag).

Cervus gymnotis, *Wiegmann's Isis*, 1833, p. 963; *Abbild. Säugeth.* t. viii.; *Schreber, Säugeth.* v. t. 247 *i* & 247 *k* (good; male, female, and young); *Suppl.* iv. p. 380; *Pucheran, Arch. du Mus.* vi. p. 363, t. 25 (male), t. 23. f. 2–10 (horns good).

Cervus nemoralis, *Ham. Smith*, iv. p. 137, t. (colouring not good); *Wagner, Suppl.* iv. p. 383?; *Pucheran, Arch. du Mus.* vi. p. 363 (from Honduras).

Texian Deer (Mazama mexicana), *Gray, Knowsley Menag.* t. 46 (male and female in winter).

Hab. Central America: Costa Rica (*Salvin*, B. M.); Oaxaca, S. Mexico (skull and horns, B. M.); Vera Cruz (*Sallé*; horns, B. M.); Texas (*Lord Derby*); Cayenne (*Buffon*); Guiana (*Schomburgk*); Honduras; Santa Fé de Bogotá.

In Lichtenstein's work the figures of the horns look rather larger than the specimens we have in the Museum; but it is to be observed they scarcely exceed the length of the head, and are described as $5\frac{1}{2}$ inches long. The ears are not more naked than the other species.

There is a pair of horns very similar to the series from Mexico and Costa Rica, but differing in the beam being more elongated and arched forward in front.

Ham. Smith identifies his Deer with the horns from Cayenne figured by Cuvier, and with a specimen from Cayenne and Honduras, but the haunches are represented too white.

There is a skull in the Museum (52, 12, 26, 160) which evidently belongs to this group, with horns much more slender, but otherwise similar; and the skull is much narrower for its length, and has the preorbital pit oblong triangular at the base, instead of nearly circular. It was received from the Zoological Society in 1852 as having come from S. America. It also differs considerably in having the hinder openings to the nostrils much narrower and the palate strongly keeled in front of them, which is not found in the other skull from Mexico. It may be distinguished as *Cariacus leptocephalus*).

12. EUCERVUS.

Horns rather curved forwards and outwards; subbasal snag on the inner side, but some distance above the base; median snag anterior, furcate; upper snag posterior, making the antlers bifurcate. Metatarsal gland large, elongate. Hoofs rather elongate. Tail hairy beneath. (Gray, Ann. & Mag. N. H. 1866; Cat. Ungul. B. M. t. 34. f. 4, as *Cariacus*.)

Cervus, Section C, *Spencer Baird, Mam. N. A.* 637, figs. 19–22.

Horns like those of *Blastocerus*, but curved, and generally with a subbasal snag.

Eucervus is characterized by the horns being doubly forked, the

forks being nearly equal. There is sometimes a small snag on the inner side of the lower part of the beam; but this is often wanting. The outside of the metatarsus has a large elongated gland. Hoofs triangular, narrow. The skull broad; suborbital pit large, triangular. The skulls of both sexes are described in my 'Catalogue of Ungulate Mammalia in the British Museum,' p. 283. There are two well-described species found in the Western States of North America.

The Long-eared or Mule Deer of the Western States of North America are very imperfectly known in Europe; and the examination of the horns, which I had not before seen, has shown me that they have been very erroneously placed with the genus *Cariacus*. Dr. Spencer Baird, in his excellent work on the Mammals of North America, has formed for them a distinct section of his genus *Cervus*.

The *Cariaci* or Savanna Deer have the upper part of the beam of the horns curved forward, with the upper branches arising from its hinder edge; they generally have a single subbasal snag some distance from the base; and the outside of the metatarsus has a short broad gland. The skull is elongate, narrow, and the suborbital pit is small. The Mule Deer, on the contrary, have a doubly forked subereet horn, like the genera *Blastocerus* and *Furcifer* of South and Tropical America. They differ from both these genera in having a large elongated gland on the outside of the metatarsus, rather differently formed horns, and a broad short skull.

1. Eucervus macrotis. (The Mule Deer.) B.M.

Anal disk and tail white, end black; end of nose and upper lips black. Ears very large. Fur very thick, brown, with subterminal white rings; dorsal line dark blackish; tail club-shaped, white.

Cariacus macrotis, *Gray, Cat. Ungul. B. M.* p. 234.
Eucervus macrotis, *Gray, Ann. & Mag. N. H.* 1866, xviii. p. 339.
Cervus macrotis, *Gray, Knowesley Menag.* p. 87; *Spencer Baird, Mamm. N. A.* p. 656, figs. 19, 20 (horns); *Schreber, Suppl.* v. t. 247. f. ; *Pucheran, Arch. du Mus.* vi. p. 369.
Cervus hippelaphus (part.), *Cuvier, Oss. Foss.* iv. p. 43, t. v. f. 35.

Hab. North-west America: Cumberland R., Fort Colville (*J. K. Lord*; B. M., two specimens).

2. Eucervus columbianus. B.M.

Anal disk none; rump like back. "Tail cylindrical, hairy and white beneath, almost entirely black above."

Cervus columbianus, *Richardson, F. B.-A.* t. 25; *Spencer Baird, Mamm. N. A.* p. 659, f. 22, 23 (horns), t. 23. f. 2 (feet).
Eucervus columbianus, *Gray, Ann. & Mag. N. Hist.* 1866, xviii. pp. 338, 339.
Cervus Lewisii, *Peale, U. S. Ex.* 1848, p. 39: *Gray, P. Z. S.* 1850, p. 239.
Cervus Richardsonii, *Aud. & Bach. N. A. M.* ii. p. 211, t., iii. p. 47, t. 106.

Cariacus punctulatus, *Gray, Cat. Ungul. B. M.* p. 232; *P. Z. S.* 1850, p. 239, t. 28.
Cerf de Colombia, *Pucheran, Arch. du Mus.* iv. t. 23. f. 1 (adult horns).
Black-tailed American Deer (Mazama americana), *Gray, Knowsley Menag.* t. 44 (summer) and t. 45 (winter).

Hab. North America: California, Columbia, Oregon, S. Francisco, S. Diego.

Mr. Titian Peale describes the hoofs of his Mule Deer as different from those of the Black-tailed Deer; but Dr. Spencer Baird says that the hoofs of both the species he describes were alike and slender; so that perhaps Mr. Peale's animal may be a third species of the genus, characterized by the hoofs, like the Elk and the Wapiti.

Dr. Spencer Baird refers *Cervus punctulatus* (Gray, P. Z. S. 1850, t. 28) to this species with doubt; but he states he has not been able to refer to the figure. Most probably, as it came from California, it does belong to this species; but, unfortunately, the skin was not preserved when it died.

3. *No metatarsal gland on the outer side of the bone. The antlers without any anterior basal snag.*

V. THE GUAZUS.—*Antlers erect, forked. Gland and tuft of hair on the outside of the metatarsus wanting.*

13. BLASTOCERUS. (The Guazu.)

Antlers ascending, straight, erect; median branch anterior, furcate; upper branch posterior, rarely wanting. Tail very short. Ears large. Fur soft. Skull with a wide oval, rather deep, preorbital pit; intermaxillaries reaching to the nasals. (Gray, Cat. Ungul. B. M. p. 223, t. 35. f. 1, head and horns.)

1. Blastocerus paludosus. (The Guazupucú.) B.M.

Large. Horns stout, much granulated.

Blastocerus paludosus, *Gray, Cat. Ungul. B. M.* p. 224.
Cervus paludosus, *Lichtenstein, Darstellung*, t. 17 (male and female); *H. Smith*, iv. p. 134, t. (horns, bad).

Hab. South America: Brazil and Paraguay.

The horns vary in sharpness and length of the snags, and in the distinctness of the granulations.

2. Blastocerus campestris. (The Mazame or Guazuti.) B.M.

Horns slender, moderately rough.

Blastocerus campestris, *Gray, Cat. Ungul. B. M.* p. 224, t. 35. f. 1–3 (head and horns).
Cervus campestris, *Lichtenstein, Darstellung*, t. 19 (male, female, and young); *Schreber, Suppl.* v. t. 251 *b*; *Hamilton Smith*, iv. p. 136, t.
Cervus leucogaster, *Schreber, Suppl.* v. p. 1127.

Hab. Northern Patagonia (*Darwin*); Brazil and Paraguay.

14. FURCIFER.

Horns erect, without any basal snag. Ears narrow, acute. Tail short. Fur thick, rather brittle, waved hairs. Skull with a triangular, rather shallow suborbital pit. Intermaxillaries broad, triangular, not reaching the nasals.

Furcifer, *Gray, Cat. Ungul. B. M.* p. 226.
Hippocamelus, *Leuckart.*
Cervequus, *Lesson* (from *Molina*).

1. Furcifer antisiensis. (The Guemul or Tarush.) B.M.

Furcifer antisiensis, *Gray, Cat. Ungul. B. M.* p. 226.
Cervus chilensis, *Gay & Gervais, Ann. Sci. Nat.* 1846, p. 91, t. (skull).
Cervus antisiensis, *D'Orbigny, Voy. Amer. Mer.* t. 20.

Hab. Bolivian Alps and Pern; Chili (*Molina, Gay*). Mus. Paris. The skull in the British Museum.

Travellers in Chili have mentioned a two-hoofed animal, called *Guemul*, or *Huamul*. It has been so indistinctly indicated that Molina regarded it as a Horse, Hamilton Smith as a Llama, and the compilers (such as Leuckart and Lesson) considered that it might be a peculiar genus, for which they gave the compound names of *Hippocamelus* and *Cervequus*. M. Gay (1838) regarded it as a new genus, but did not give a name to it.

In 1846 MM. Gay and Gervais, when preparing a work on the Mammals of Chili, described a young specimen in the Paris Museum without horns under the name of *Cervus chilensis*; and M. Philippi, in Wiegmann's Arch. 1870, p. 46, says that M. Gay's animal is the same as *Cervus antisiensis*, D'Orbigny. As the first skin we received of *Capreolus leucotis* was sent from the coast of Chili, I thought that it was the long-lost *Guemul* of Molina; but M. Philippi, who lives at Santiago, says that *C. leucotis* does not inhabit Chili. The skin was probably obtained, like Mr. Whitely's specimens, from the Peruvian Andes.

References to the works of the compilers are given in my 'Catalogue of Ungulata,' p. 227.

VI. The Guemuls.—*Antlers erect, with conical snags, and the large horizontal basal posterior branches with regular conical snags. No external metatarsal gland.*

15. XENELAPHUS.

The horns divide from the base into two branches: the front one is erect, conical, and acute, with a short conical branch on the outer side, and one or two more or less elongate basal anterior or interior snags in the middle. The hinder part of the base and sheath compressed, diverging horizontally into a strong, angular, tapering branch, which is nearly as long as the erect one, with several irregularly placed, more or less elongate, acute processes; the upper part, near the roots, with one or two cylindrical diverging branches

on its upper and lower sides. Like the small branches on the erect part of the horn, they are not exactly similar on the two horns.

Xenelaphus, *Gray, P. Z. S.* 1869, p. 498, fig. (horns of male, skull of female).
Anomalocera, *Gray, Scientific Opinion*, 1869, October; *Philippi, Wiegmann's Archiv*, 1870, p. 46.

The metatarsus is without any glandular tuft on the outside. On the inner side of the hock is a large rounded tuft of such hairs. The fur consists of thick, elastic, tubular quills. The skull has a well-marked, deep, triangular pit in front of the orbit, and well-developed canines in both sexes. The female is without horns.

It has been suggested that, as I have only seen one specimen of the male, the horns may be those of an individual monstrosity, and not of the normal form; but this I consider to be very doubtful. If they are not quite of the normal form, it is clear they are not a monstrosity of the regularly forked horns of *Furcifer*.

1. Xenelaphus leucotis.

Capreolus leucotis, *Gray, P. Z. S.* 1849, p. 64, t. 12.
Capreolus? huamel, *Gray, Knowsley Menag.* p. 66.
Furcifer huamel, *Gray, P. Z. S.* 1850; *Cat. Ungul. B. M.* p. 227.
Anomalocera huamel, *Gray, Scientific Opinion*, 1869, p. 385.
Xenelaphus huamel, *Gray, P. Z. S.* 1869, p. 497, f. (horns), p. 498, f. (skull of female).
Anomalocera leucotis, *Philippi, Wiegmann's Arch.* 1870, p. 46.

Hab. Peruvian Andes. From Tinta.

Male, female, and young in B. M., and skulls of female and fawn.

In 1849 the Earl of Derby received from his brother-in-law, from the coast of Chili, an imperfect skin of a female, which he sent to the British Museum. The fur was of a different colour from that of the specimen described by MM. Gay and Gervais; and, finding the animal to agree in size, colour, and kind of fur with the Roebuck of Europe, I described and figured it, in the 'Proceedings' of the Zoological Society for that year, under the name of *Capreolus leucotis*; and in the 'Proceedings' of the Society for the next year, and in my 'Catalogue of the Two-hoofed Quadrupeds in the British Museum,' p. 227, I regarded it as a species of *Furcifer*, under the name of *F. huamel*.

Mr. Whitely, junior, sent from Tinta, in South Peru, to the British Museum a perfect male, female, and fawn of this species, and some skulls of the female, which induced me to regard the *Cervus chilensis* of Gay and my *Capreolus leucotis* as different stages of the same species, as those then received agree with Gay's description of the young animal in the Paris Museum and are in the yellow state of the fur, but the female exhibits in the middle of the back some of the dark fur of the animal (sent by the Earl of Derby) which I described; but M. Philippi, in a recent paper above quoted, states decidedly that the *Cervus chilensis* is a synonym of *C. antisiensis*,

which is the Guemul of Molina, and that *C. leucotis* is not found in Chili. This animal is very like the Roebuck of Europe, but without any glandular tufts on the outer side of the metatarsus. The horns are very peculiar, and unlike those of the Roebuck, or of the Tarush or Roebuck of Bolivia (*Furcifer antisiensis*), which is the type of the genus *Furcifer*.

The male now obtained had a well-developed but rather unsymmetrical pair of horns, which are so unlike the horns of any other Deer that I propose to form for them a genus, which I proposed, in the first short notice of it in 'Scientific Opinion,' to call *Anomalocera*; but finding that name preoccupied, in the more detailed account of it I changed that name to *Xenelaphus*.

There is in the British Museum a male Deer, purchased from the Zoological Society, August 1851, said to have come from South America, rather more than 2 feet high at the withers, which has only small knobs in the place of horns. It is of a pale brown colour, more dusky on the head, back of the neck, shoulders, and outside of the legs; a distinct yellowish streak over the upper edge of the orbit; the inside of the upper part and the front edge of the thighs and the underside of the tail white. It has no appearance of natural metatarsal glands. The ears are moderate and nakedish. The nose and middle of the chin is dark blackish, with a large triangular spot on the front of the upper lip, and a narrow white cross band immediately under the front of the lower lip; so that it differs from *Cariacus* and *Coassus* in the colouring of the nose and chin, and from the former in the want of the metatarsal gland. It agrees in some respects with the figure of *C. paludosus*; but the whole upper part and forehead are black, and the underside of the tail white, and the legs are not black as represented by Lichtenstein.

It cannot be the original specimen of *punctulatus*, which must have been living about the same time; for that was a female, and had the base of the ears and the orbits and the abdomen white, and it had a white spot behind the dark part of the nose, and a black tail, as is well represented in Wolf's figure. It may be temporarily named *Homelaphus inornatus*.

There was in the Zoological Gardens in 1850 a female Deer much smaller than *Cariacus virginianus*. The fur was a very deep reddish brown in summer, with a distinct subterminal band on the hair grey-brown in winter. It differed from *Cariacus* in having no visible metatarsal gland. I described and figured it in the Proc. Zool. Soc. 1850, p. 239, t. 28 (Cat. Ungul. B. M. p. 232). Spencer Baird, probably on account of its habitat, refers this species, with doubt, to *Cervus columbianus*; but says he has not been able to consult the figure. The want of the metatarsal gland, and the small size of the animal make me think it is probably a *Coassus* or a *Blastocerus*. Unfortunately the skin does not appear to have been preserved.

VII. The Brockets.—*Antlers simple, rudimentary, shelving back. No metatarsal gland on the outside of the bone. Crown tufted. Suborbital pit deep. Front of upper lip, under nostril, and front of chin white.* South America.

16. COASSUS.

Face elongate. Ears short and broad. Crown with long hairs directed backwards, and forming a crest at the base between the horns. Crumen small, circular. Hair smooth. Horns simple, subulate. Small white spot quite in front of the upper lip. Fawn spotted; dorsal line one-coloured. Skull with a deep triangular suborbital pit; intermaxillaries triangular. (Cuvier, Oss. Foss. iv. t. 5. f. 44 and 50; Gray, Cat. Ungul. B. M. p. 238, t. 35. f. 4.)

The skulls of the females have not the preorbital pit so deep as in the males. The preorbital pit in the skulls of *C. rufus* are not so large as in *C. nemorivagus*, comparing sex with sex. In a skull of a female fawn of *C. rufus* in the Museum, no. 684*c*, the pit is shallow, and differs in size and depth on the two sides. There is also one skull, no. 684*b*, of an older female received from Pará, which is said to have belonged to *C. rufus*; and it is only slightly concave in front of the orbits, without any distinct pit. In the skulls of two males, of very different sizes, in the Museum, the intermaxillaries just reach the nasals; in the skulls of two females they stop a short distance from those bones. We want a larger series of skulls of authentic specimens to study the value of these modifications.

1. Coassus nemorivagus. (The Guava Viça.) B.M.

Fur uniform pale brown; underside of body and inner side of limbs rather paler, with a distinct streak on the forehead before the front of the eye. Fawn pale rufous, with many distinct white spots, separate on the haunches.

Coassus nemorivagus, *Gray, Cat. Ungul. B. M.* p. 237; *P. Z. S.* 1850, p. 240, t. 22 (male), 23 (female), and 27. f. 1, 3, 5.
Cervus nemorivagus, *Liehtenstein, Darstell.* t. 21 (male and female).
Coassus simplicicornis, *Gerrard, Cat. Bones B. M.* p. 268.

Hab. Bolivia; plains near Santa Cruz de la Sierra (*Bridges*).

Male with long horns.

The fawn is very like the fawn of *C. rufus*, but rather paler, but was sent by Bridges from the same locality as the adult. Both species may be found there.

2. Coassus simplicicornis. (The Brazilian Brocket.) B.M.

Fur pale brown, punctulated; hairs with a pale subterminal ring, without any superciliary streak. Fawn with large pale spots, a series of them on the haunches, confluent, forming an oblique line. Skull with a deep triangular suborbital pit, rather more shallow in the females.

Cervus simplicicornis, *Illiger; Prince Maximilian, Abbild.* t.; *Ham.*

Smith, p. 141, t.; *Schomburgk, Reisen in Britisch Guiana*, iii. p. 785.

Coassus nemorivagus (part.), *Gerrard, List Bones in B. M.* p. 268.

Hab. Brazil; Bahia; British Guiana (*Schomburgk*). B.M.

The colouring of H. Smith's figure is incorrect as regards the white on the mouth.

The skull figured by Cuvier is probably a *C. nemorivagus*, as it came from British Guiana.

3. Coassus rufus. B.M.

Fur bright shiny red-brown, or with minute dark tips to the hairs.

Coassus rufus, *Gray, Cat. Ungul. B. M.* p. 238, t. 35. f. 4; *Knowsley Menag.* t. 47, 48 (summer and winter); *P. Z. S.* 1850, t. 24, t. 27. f. 2 (head and animal).

Cervus rufus, *Lichtenstein, Darstellung*, t. 20 (rufous brown).

Hab. Brazil (male and female in B. M.); Pará; Surinam.

4. Coassus superciliaris. (The Eyebrowed Brocket.) B.M.

Fur bright shining red-brown; neck and head, hocks and front of fore legs whitish grey; forehead blackish, with a distinct streak over the front part of the orbit. Skull with a moderate-sized triangular suborbital pit. Fawn red-brown, with many white spots, not confluent into a streak on the haunches. Skull with a very small suborbital pit in a slight concavity.

Coassus superciliaris, *Gray, Cat. Ungul. B. M.* p. 239; *Knowsley Menag.* t. 48; *P. Z. S.* 1850, t. 27. f. 4 (head), t. 25 (animal).

Hab. Brazil (B. M., purchased of Hulse); St. Catharine's, male and young (*Parzudaki*, B.M.).

The large male has the edge of the upper lip white.

a. *Cervus rufinus*, Pucheran, Arch. du Mus. vi. p. 491, t. 30 (animal); Boure. & Puch. in Rev. et Mag. Zool. 1851, iii. p. 361. Dark red-bay; feet and sides of nose blackish. *Hab.* Venezuela and New Granada.

b. *Coassus auritus* (the Large-eared Brocket), Gray, Cat. Ungul. B. M. p. 239; P. Z. S. 1850, t. 27. f. 6, t. 26 (animal). *Hab.* Brazil? The skin of this species does not seem to have been preserved.

c. *Coassus tolteeus*. *Hab.* Mexico (fide *Sclater*).

17. PUDU.

Antlers simple, rudimentary, shelving backward. Ears rounded, covered with short hair. Head short. Crumen distinct. Tail short. Skull short and high; infraorbital pits oblong, deep; intermaxillaries short, not reaching the nasals. (Gray, Cat. Ungul. B. M. p. 240, t. 36. f. 1.)

1852

1. **Pudu humilis.** (The Venada.) B.M.

Pudu humilis, *Gray, Cat. Ungul. B. M.* p. 240; *P. Z. S.* 1864, p. 105 (head and horns); *Sclater, P. Z. S.* 1871, p. 238, fig. 1, tab. 17 (animal).
Cervus pudu,
Ovis dubia, *Afzelius, N. Act. Sc. Upsal.* vii. p. 217.

Hab. West coast of South America; Chili; Conception and Chiloe.

Fam. 21. CERVULIDÆ.

Face with two longitudinal ridges, and a moist, naked groove on the inner side, which are much elongated, and support the small horns. Muffle moist, moderate. Canine teeth exserted. Crumen large and deep. Tail elongate, tufted. Fur thin shining hair, not spotted. Metatarsus without any tuft or gland-hair outside. Hoofs triangular. Skull with a very large, deep suborbital pit. Forehead concave, with two strong ridges, which form the base of the peduncles of the horns in the males.

1. CERVULUS.

Cervulus, *Gray, Cat. Ungul. B. M.* p. 217, t. 32. f. 2 (skull and horns).

* *Head elongate. Skull: nose elongate, narrow, from the front of the orbit longer than from the front of the orbit to the occiput; cheek-pit large.*

1. **Cervulus moschatus.** (The Ratwa.) B.M.

Pale reddish bay; the outside of the legs blackish; nape without any black central line. Fawn rather darker, with small white spots on each side of the back and haunches. Series of grinders elongate, $2\frac{3}{8}$ inches long.

Cervulus moschatus, *Gray, Cat. Ungul. B. M.* p. 218, t. 32. f. 2 (skull and horns).

Hab. India, in jungles: Nepal.

Length of skull $8\frac{1}{4}$ inches; width of underside of orbits $3\frac{1}{2}$ inches; length of nose from front edge of orbit $4\frac{5}{8}$ inches; length of tooth-line in upper jaw $2\frac{3}{8}$ inches; of nose beyond teeth $2\frac{7}{8}$ inches. Intermaxillaries elongate, narrowed above.

One of the skulls, without habitat, has a small circular pedicelled disk, tubercled on its upper surface like a small bur of a horn growing on the outside of the peduncle of the horn. There is the commencement of a similar tubercle on the peduncle of the other side.

2. Cervulus curvostylis. B.M.

Pedunclcs of the horns angularly recurved just near the base, and nodulose at the upper side of the base. Skull rather broad; the cheek-pit very large.

Cervulus curvostylis, *Gray*.

Hab. Siam: Pachebon (*Mouhot*).

May be only an accidental variation; but if so, it is extraordinarily regular. Length of tooth-line $2\frac{1}{4}$ inches.

3. Cervulus tamulicus. (Barker.) B.M.

Skull: tooth-line shorter than in *C. moschatus*, $2\frac{1}{8}$ inches long; cheek-pit smaller, more circular.

Cervus muntjac, *Sykes, P. Z. S.* 1831, p. 104.
Kaleeatoo, or Stag Deer of the Tamouleans, *Hardwicke*.

Hab. Southern India: the Deccan (*Sykes & Elliot*).

"Deep chestnut, becoming browner as the animal grows old. Had many bred in his park, and never observed the young to be spotted." —*Elliot*.

a. *Cervulus vaginalis*. (The Kijang or Muntjac.) *Cervulus vaginalis*, Gray, Cat. Ungul. B. M. p. 217. *Hab.* Sumatra; Java.

b. *Cervus (Muntjac) philippinus*, H. Smith, Griffith's Anim. King. iv. p. 187, t. 164. f. 5, v. p. 803. *Hab.* Philippine Islands.

** *Head short. Skull short, broad. Nose from the front of the orbit the same length as from the front of the orbit to the occiput. Cheek-pits very large. Molars broad, forming a short series.*

4. Cervulus Reevesii. (The Chinese Muntjac.) B.M.

Fur reddish, minutely punctulated with yellow-grey; nape and back of the neck with a distinct black central line; outside of the legs blackish brown. Fawn darker, punctulated; sides of face, throat, and underpart of body pale yellowish; crown and nuchal streak black. (Skull, tab. 2. f. 3.)

Cervus Reevesii, *Gray, Cat. Ungul. B. M.* p. 220; *Swinhoe, P. Z. S.* 1862, p. 361, 1870, p. 644.

Hab. China. Found from Canton to Ningpo, and in Formosa (*Swinhoe*, B.M.).

Length of skull $5\frac{3}{4}$ inches; length of nose from front of orbit $2\frac{7}{8}$ inches; length of tooth-line $1\frac{5}{8}$ inch, of nose beyond tooth-line $1\frac{3}{4}$ inch; intermaxillaries short and broad; width of lower edge of orbit $2\frac{7}{8}$ inches. T. II. f. 3.

†† *Antlers none. Canines well developed, often long. The tarsi sometimes naked on the hinder side.*—Moschina, *Gray, Cat. Ungul. B. M.* p. 241.

Fam. 22. MOSCHIDÆ.

Throat and hinder edge of the tarsus covered with hair. The median metacarpal bones united into a single cannon. Intermaxillaries reaching the nasals. The placenta divided into a great number of cotyledons. Stomach quadripartite.

Moschidæ, *Sclater, Ann. & Mag. N. H.* 1866, xviii. p. 403; *A. M.-Edwards, Ann. Soc. Nat.* xviii. p. 120.

1. HYDROPOTES.

Male without any odoriferous gland on the abdomen. Crumen moderate. Fur very thick, formed of thick, erect, bristle-, prickle-like hairs, annulated at the tip; hinder part of tarsus covered closely with hair. Skull with a deep triangular pit before the orbit; nose-hole oval, contracted above and below; intermaxillaries reaching the nasals.

Hydropotes, *Swinhoe, P. Z. S.* 1870, p. 90.

1. Hydropotes inermis. B.M.

Hydropotes inermis, *Swinhoe, P. Z. S.* 1870, p. 90, t. 6, & t. 7 (skull).
Hyelaphus porcinus, *Swinhoe, P. Z. S.* 1865, p. 510.

Hab. China: Port Chingkiang. Sold in Shanghai market.

"Measurements taken from the stuffed skin of an animal about three-quarters grown:—Length from nose to rump 29 inches, of tail 3, of fore leg from shoulder 18, of hind leg 20, across the eye ·7, across the nose ·7; length of head 6·75, of ear $3\frac{1}{2}$, of canine tooth 1·1.

"General colour light chestnut, stippled with black, redder on the head and back of ears. Round the nose, eyebrow, chin, and throat pure white. Inside of ear light buff, whiter near base, its outer edge, at tip, black. Neck paler, its under portion plain-coloured. Shoulder, fore and hind legs, and tail light brownish chestnut. Belly pale buff-white. The chestnut colouring of the upper parts deepens along the back, and pales downwards on the sides.

"The hair of the nasal region very short. At the corner of the lower lip springs a tuft of stiff white hairs. Bristles about the muzzle short and few. Eye small. Ears well clothed inside. Hair coarse and stiff, of the neck and rump longest. Each hair of the upper body is flattened, and undulates from side to side, or is zigzag in its length, giving it in some views quite a spiral appearance. I notice the same peculiarity in the corresponding hair of the *Moschus*. Each of these hairs in our animal is white from its base for the greater part of its length, then blackish brown, ending with a light

chestnut tip; thus, the hairs overlapping each other, the chestnut tips give the general ground-colour, and the blackish rings the stippling.

"*Fore leg.* Length of hoof in front 1·25, breadth of each segment ·75; length of hind toe ·75, its breadth ·45, raised about ·75 above the sole of the foot.

"*Hind leg.* Length of hoof 1·18, breadth of each segment ·63; length of hind toe ·60, its breadth ·45, raised above sole of foot 1·30.

"They crouch in the reeds and long grass, admitting pretty close approach, and then, rising with a bound, spring away. They were generally put up singly or in twos and threes. In running they cock their ears, round their fore legs, bend up their hind legs, hog their rumps, and scurry away with little quick leaps, very much after the manner of a Hare. The heavy shot soon bowled them over. When they ran across the cultivated fields, the Chinese shouted after them and set their barking curs to pursue them.

"The Chinese at Shanghai call this animal the *Ke*; but at Chinkiang they are called *Chang*—the classical term for the Muntjac (*Cervulus Reevesi*). The Chinese dictionary compiled under authority of the Emperor Kanghe describes the *Ke* as 'Stag-like, with feet resembling those of a dog, has a long tusk on each side of the mouth, and is fond of fighting.'"—*Swinhoe*, *P. Z. S.* 1870, pp. 89–92.

2. MOSCHUS.

Crumen none. The hinder part of tarsus hairy. Fur thick, elastic, brittle. Males with an odoriferous gland in the middle of the abdomen. Young, and sometimes the adult, spotted. Tail very short, rudimentary. Snowy region of Asia. (Gray, Cat. Ungul. B. M. p. 242; A. M.-Edwards, Ann. Sci. Nat. 1864, p. 119.)

1. Moschus moschiferus. (The Musk.)

Moschus moschiferus, *Gray*, *Cat. Ungul. B. M.* p. 244; *A. M.-Edwards*, *Ann. Sci. Nat.* 1864, ii. p. 119, t. 4. fig. 1 (skeleton).

Hab. Thibet; Nepal (not Bengal, as said by M. A. Milne-Edwards, p. 164).

Var. 1. Fur spotted.

Moschus sibiricus, *Pallas*: *Gray*, *Cat. Ungul. B. M.* p. 243.
Moschus moschiferus, var. maculatus, *A. M.-Edwards*, *l. c.* p. 120.

Var. 2. Fur banded.

Moschus altaicus, *Eschscholtz.*
Moschus moschiferus, var. fasciatus, *A. M.-Edwards*, *l. c.* p. 119.

Var. 3. Fur uniform.

La forte Musque, *Daubenton.*
Moschus moschiferus, *Schreber*, *Gray*, *Cat. Ungul. B. M.* p. 244.
Moschus moschiferus, var. concolor, *A. M.-Edwards*, *l. c.* p. 121.
Moschus leucogaster, *Gray*, *Cat. Ungul. B. M.* p. 245.

Var. 4. Grey-brown; ears, throat, and chest bright yellow.

Moschus chrysogaster, *Gray, Cat. Ungul. B. M.* p. 245, t. 25. fig. 1 (skull).

Hab. Nepaul.

Fam. 23. TRAGULIDÆ.

Throat and hinder edge of the tarsus bald and callous. Fur close-pressed, soft. Throat white-streaked. Young coloured like the adult. The median metacarpal bones united into a cannon. Skull: intermaxillary broad, reaching to the nasals. Placenta diffused. Stomachs three. Cutting-teeth in an interrupted series, the middle broadest. Stomach quadripartite, and divided into a great number of cotyledons.

Moschina II. (Pigmy Musks), *Gray, Cat. Ungul. B. M.* p. 246.
Tragulidæ (part.), *A. M.-Edwards, Ann. Sci. Nat.* 1864, ii. p. 121; *Sclater, Ann. & Mag. N. H.* 1866, xviii. p. 403.

1. MEMINNA.

Chin entirely covered with hair. Hinder edge of the metatarsus covered with hair, with a large, smooth, naked prominence on the outer side rather below the hock. Fur white, striped, and spotted. Legs short. (Gray, Cat. Ungul. B. M. p. 246, t. 24. f. 2, skull; A. M.-Edwards, Ann. Sci. Nat. 1864, tab. 3. f. 2.)

1. Meminna indica.

Meminna indica, *Gray, Cat. Ungul. B. M.* p. 246, t. 24. f. 3 (skull).
Tragulus meminna, *A. M.-Edwards, Ann. Sci. Nat.* 1864, ii. p. 125, t. 3. f. 2, t. 10 (osteol.).

Hab. India, Ceylon.

2. TRAGULUS.

Throat and chin nakedish, subglandular, with a callous disk between the rami of the lower jaw, from which a band extends to the fore part of the chin; hinder edge of the metatarsus naked and callous. Fur soft, not spotted. (Gray, Cat. Ungul. B. M. p. 248, t. 25. f. 3, skull; A. M.-Edwards, Ann. Sci. Nat. 1864, tab. 7–9.)

The male has the hinder part of the vertebral column and pelvis covered with an expanded bony disk, formed by the ossified dorsal fascia (Gray, P. Z. S. 1869, p. 226, fig.). M. A. M.-Edwards figures it as only covering the pelvis (Ann. Sci. Nat. 1864, tab. 4. f. 2). It has not been observed in the female specimen. M. A. M.-Edwards

figures the pelvis of *Meminna* without any bony expansion (*l. c.* tab. 10. f. 7).

a. *Throat yellow. Streak on each side of lower jaw and three on lower part of throat white, all separated. Nape without any dark central streak.*

1. Tragulus Stanleyanus. (The Stanley Musk.) B.M.

Fulvous; chest and abdomen white.

Tragulus Stanleyanus, *Gray, Cat. Ungul. B. M.* p. 249, t. 25. f. 3 (skull); *Gleanings, Knowsley Menag.* t. 33; *A. M.-Edwards, Ann. Sci. Nat.* 1864, tab. 3. fig. 1, tab. 7 (fœtus).

Hab. India (not Singapore).

b. *Chin and throat white, with a brown diverging streak on each side of the throat, and a cross band separating throat from the chest. Nape with a dark central streak.*

2. Tragulus javanicus. (The Napu.)

Fur pale brown, intermixed with black-tipped hairs. Neck and throat-streaks dark brown, grizzled with white, the latter separate above; sides of face and forehead fulvous; middle of belly white.

Tragulus javanicus, *Pallas, Spicil. Zool.* xiii. p. 18; *Gray, Cat. Ungul. B. M.* p. 249; *A. M.-Edwards, Ann. Sci. Nat.* 1864, ii. p. 123, tab. 2. fig. 1 (jun.).
Tragulus napu, *A. M.-Edwards, Ann. Sci. Nat.* 1864, ii. p. 123, tab. 2. fig. 2 (bad, adult), tab. 4. fig. 2, tab. 8 (skeleton).

Hab. Java and Sumatra.

T. napu of Milne-Edwards is the adult, and his *T. javanicus* the young state of this species. In his figure of *javanicus* the under part is represented too grey.

3. Tragulus fulviventer.

Fur pale brown, intermixed with darker hairs; neck and throat-streaks rather more yellow; throat-streaks narrow, close together, or confluent above; nape-streak black; belly white, more or less yellow-varied.

Moschus kanchil, *Horsfield.*
Tragulus affinis, *Gray, List of Mammalia B. Mus.* 1843, p. 173; *P. Z. S.* 1861, p. 138 (described).
Moschus fulviventer, *Gray, P. Z. S.* 1836, p. 65.
Tragulus pygmæus, var. 2, *Gray, Cat. Ungul. B. M.* i. p. 250.
Tragulus kanchil, *A. M.-Edwards, Ann. Sci. Nat.* 1864, p. 122, tab. 2. fig. 3 (?).

Hab. Java (*Horsfield*); Camboja (*Mouhot*).

There is no specimen in the Museum agreeing with M. A. M.-Edward's figure in having a blackish head; in one specimen the lateral streaks on the throat are very narrow on the sides and interrupted, and the middle of the belly is more than half fulvous; this is

the specimen I named *Moschus fulviventer*; but the two specimens from Camboja and the one from Java have also the belly varied with fulvous.

4. Tragulus pygmæus.

Fur dark yellow-brown with, numerous black hairs; neck and throat-streaks more golden, broad, confluent, and forming a central streak above, with a cross streak at their upper end. Nape-streak black. Belly white, more or less yellow-varied.

Tragulus pygmæus, *Gray, Cat. Ungul. B. M.* p. 250.
Tragulus kanchil.

Hab. Java; India.

This may be only a variety of the preceding; but it is to be distinguished by its brighter and darker colours, and by its wider neck-streaks.

Fam. 24. HYEMOSCHIDÆ.

Horns none. Canines often elongate. Back of the tarsus bald, callous. The median metacarpal bones separate in all ages; the metatarsal bones at first distinct, becoming united into a single bone. Intermaxillaries short, not reaching the nasals. The placenta not divided into cotyledons, but diffused as in the Hog and Horse. The stomach is tripartite. Africa.

1. HYEMOSCHUS.

Lower lip and chin rather nakedish, with scattered hairs. The hinder edge of the metatarsus hairy, with a large callosity on the outer side near the heel. Two lateral toes elongate, with large tapering hoofs. The intermaxillary is very short, oblong, truncated behind, and placed on the front end of the truncated maxilla. The fur spotted like *Meminna*. (Gray, Cat. Ungul. B. M. p. 247, t. 25. f. 2, skull.)

Dicroceros, *Lartet & Gervais.* Fossil.

1. Hyemoschus aquaticus. (The Boomorah.) B.M.

Hyemoschus aquaticus, *Gray, Cat. Ungul. B. M.* p. 248, t. 25. f. 2 (skull); *A. M.-Edwards, Ann. Sci. Nat.* 1864, ii. p. 126, tab. 3. f. 3 (animal), tab. 11 (skeleton).

Hab. Western Africa: Sierra Leone and Gambia; Senegal.

Suborder V. TYLOPODA.

Jaws with eight cutting-teeth above and below. Horns none. Toes elongate, with a broad pad beneath. Hoofs compressed. False hoofs none. Upper lip dependent, slightly hairy. Horns and crumen none.

Tylopoda, *Illiger, Prod.* p. 102.
Camelina, *Gray, Cat. Ungulata*, p. 251.
Hydrophoræ, *Gray, London Med. Repos.* 1821, xv. p. 307.

Fam. 25. CAMELIDÆ.

Nose produced. Upper lip dependent, naked in front, and entirely covered with hair. Horns or crumen none. Ears elongate, moderate. Cutting-teeth eight in each jaw; canine teeth in each jaw. Neck long; legs rather long; thigh free by the body (like those of Men and Apes). Nose-hole rather large, narrow. Intermaxillary elongate, reaching the nasals. Placenta not divided into cotyledons as in the Horse and Pig.

Camelidæ, *Gray, London Med. Repos.* 1821, xv. p. 307; *Ann. & Mag. N. H.* ser. 3, xviii. p. 326; *Selater, Ann. & Mag. N. H.* ser. 3, xviii. p. 433.

1. CAMELUS.

Back with one or two humps. Tail short, tufted. Toes broad; sole nearly orbicular, only separated in front. Grinders $\frac{6}{6}$, the anterior one isolated, conical, like a canine. Eastern hemisphere.

Camelus, *Gray, Cat. Ungul. B. M.* p. 252, t. 23 (skull).

1. **Camelus arabicus.** (The Sghimel or Dromedary.) B.M.

Back with a single hump.

Camelus arabicus, *Gray, Cat. Ungul. B. M.* p. 252.

Hab. Deserts of Arabia. Naturalized in North and West Africa, India, and South Europe.

2. **Camelus bactrianus.** (The Mecheri or Camel.) B.M.

Back with two humps.

Camelus bactrianus, *Gray, Cat. Ungul. B. M.* p. 253, t. 23. f. 3, 4 (skull).

Hab. Mongolian deserts.

2. LLAMA.

Back even, not humped. Tail short and hairy. Toes slender, narrow, separated in front. Grinders $\frac{5}{5}$, the anterior conical one of *Camelus* being absent. S. America.

Llama, *Gray, Cat. Ungul. B. M.* p. 254, t. 24. f. 1, 2 (skulls).
Auchenia, *Illiger.*

* *Skull short; nose short, broad; nasals rather broad, short; lachrymal openings none. Legs elongated; hinder without any appearance of elongated warts.* Vicugna.

1. Llama vicugna. B.M.

Uniform brown. Face covered with short hair, and elongate hair on the temples.

Llama vicugna, *Gray, Cat. Ungul. B. M.* p. 256, t. 24. f. 2 (skull).

Hab. Peruvian Alps.

** *Skull short; nose short; nasal bones very broad, short; lachrymal openings distinct, large. Legs short.* Pacos.

2. Llama pacos. (The Alpaca.)

Fur very long, pendent, black, or black varied with white or brown.

Llama pacos, *Gray, Cat. Ungul. B. M.* p. 260; *Wolf's Zool. Sketches*, t. 26.
Alpaca, *Murie, P. Z. S.* 1866, p. 580, t. (sheared).

Hab. South America. Domesticated.

*** *Skull elongate; nose elongate, slender; nasals slender; lachrymal openings distinct and large. Legs elongated; hinder with elongate warts.* Llama.

3. Llama guanacus. (The Guanaco.)

Fur uniform brown. Legs elongated, slender.

Llama guanacus, *Gray, Cat. Ungul. B. M.* p. 257.
Llama pacos (fera), *Gray, Cat. Ungul. B. M.* p. 260.

Hab. South America, temperate part as far south as the islands near Cape Horn.

4. Llama glama. (The Llama or Yamma.)

Fur brown or variegated. Legs elongate, slender.

Lama glama, *Gray, Cat. Ungul. B. M.* p. 260, t. 24. f. 1.
Llama, *Murie, P. Z. S.* 1866, p. 580, t. 44 (sheared).

Hab. South America. Domesticated.

"Although both Llamas and Alpacas have been bred repeatedly in the Gardens in former years, yet since 1860 no offspring has been produced.

"Until lately it has never been thought necessary to shear the animals of their long coats (that is, those in our Gardens), although in their native country, according to Colpaert, on the Alpaca this operation is performed every two or three years.

"On our male Llama the fleece has always remained perfect, until the operation of shearing was performed about the end of last August. On the female Llama, which is along with this male, it was different, as during this summer the fleece became ragged and partially dropped off, which circumstance suggested the shearing of the others. This fact is significant, and at variance with the recorded observations of the late Earl of Derby in his celebrated Knowsley collection. Upon this subject he says, 'Unlike sheep, these animals never shed their coats.'

"The same may be said of the Alpacas as of the male Llama, their fleeces exhibiting no signs of falling off.

"The operation of shearing was performed as ordinarily in sheep, and the quantities obtained were as follows:—From the brown-and-white male Llama about 14 lbs.; from the black female Alpaca 8 lbs.; and from the black-and-white male Alpaca 8½ lbs. Colpaert, one of the most recent authorities on these animals in their South-American haunts, does not compare the weights and value of the fleece in the two domesticated and two wild varieties; but he says that the Chinela, a variety of Alpaca, yields the most esteemed and heaviest kind of fleece, but it is rare that it surpasses 6 or 7 lb.

"As depicted in the plate, the Llama has more clearly a spotted appearance than when the fleece was upon it; this may partly be on account of the original intertwining of the fibres of the two different colours, and still more, no doubt, by the then accumulation of dirt and smoke which blackened the surface. The two Alpacas did not alter in colour so far as to make any marked difference in their aspect.

"The neck in all three shorn animals appears to have a far greater length proportionally to the body; and the same remark applies to the hind legs, the thighs of which are seen more than usually free from the body—a character of the family *Camelidæ*. The body in contour is entirely transformed; and the rough sheep- or goat-like hairy carcass, the awkward, uncouth, disproportionate body, with its naked flanks and generally scraggy look, detract from grace in the animals, and render their appearance more remarkable than beautiful.

"From their peculiar gait and slouching ungainly manner, if but a hump were present, they would at once recall to mind a tottering young Camel."—*Murie, l. c.*

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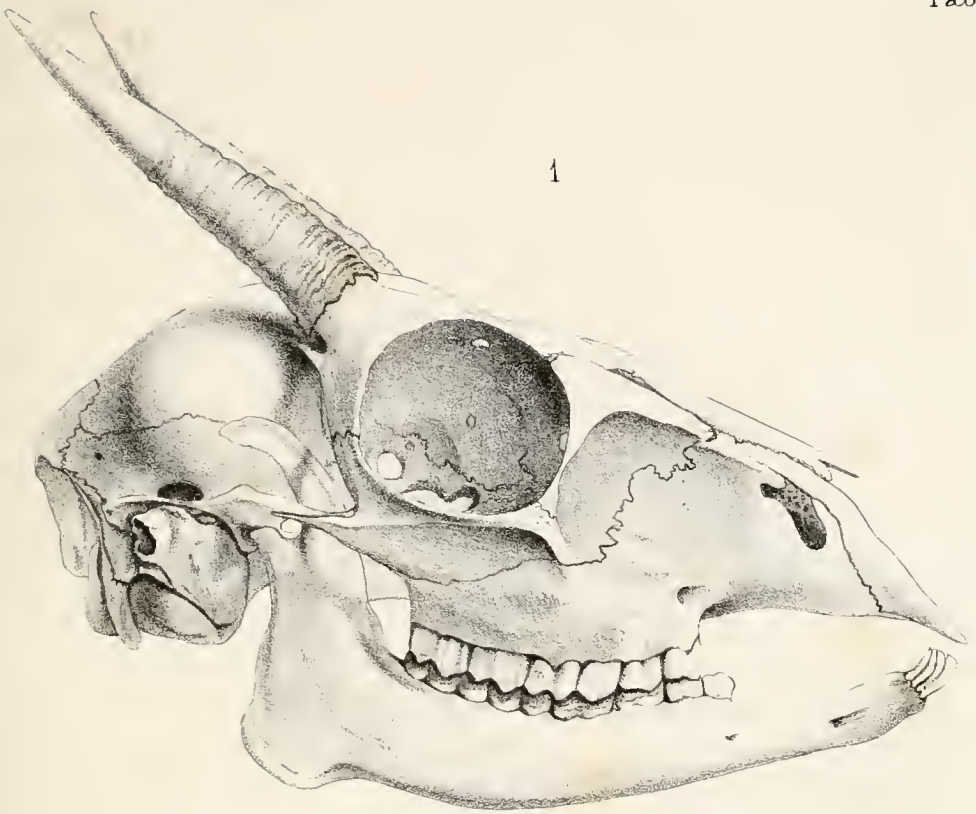


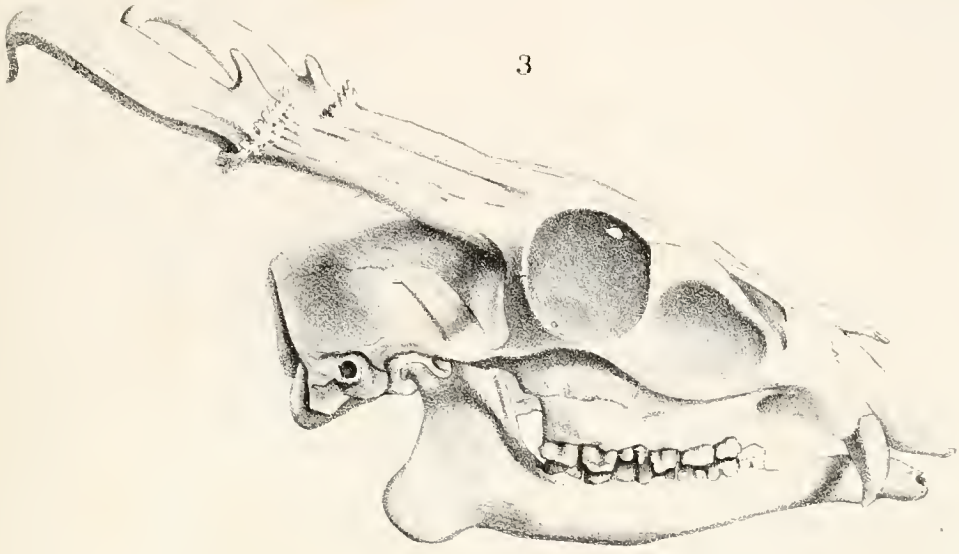
2

G.H.Ford.

Mintern Bros imp.

1. Nesotragus Livingstonianus. 2. Neotragus saltianus.

3



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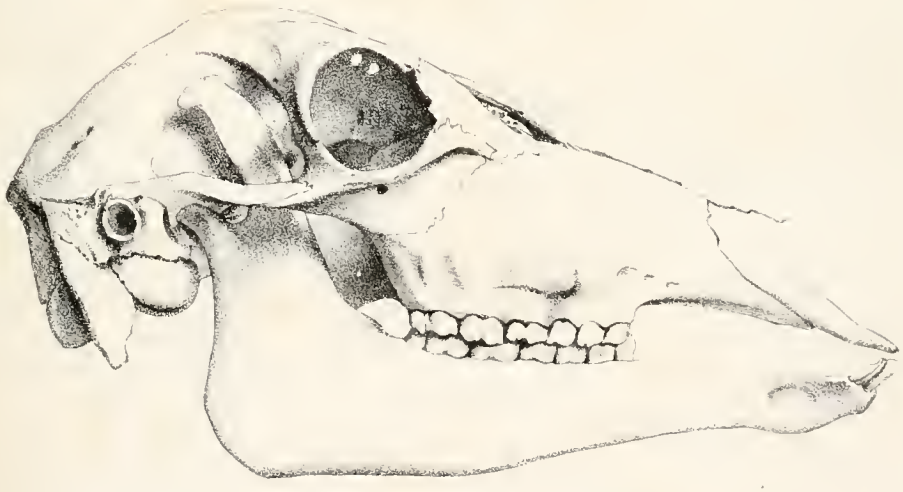
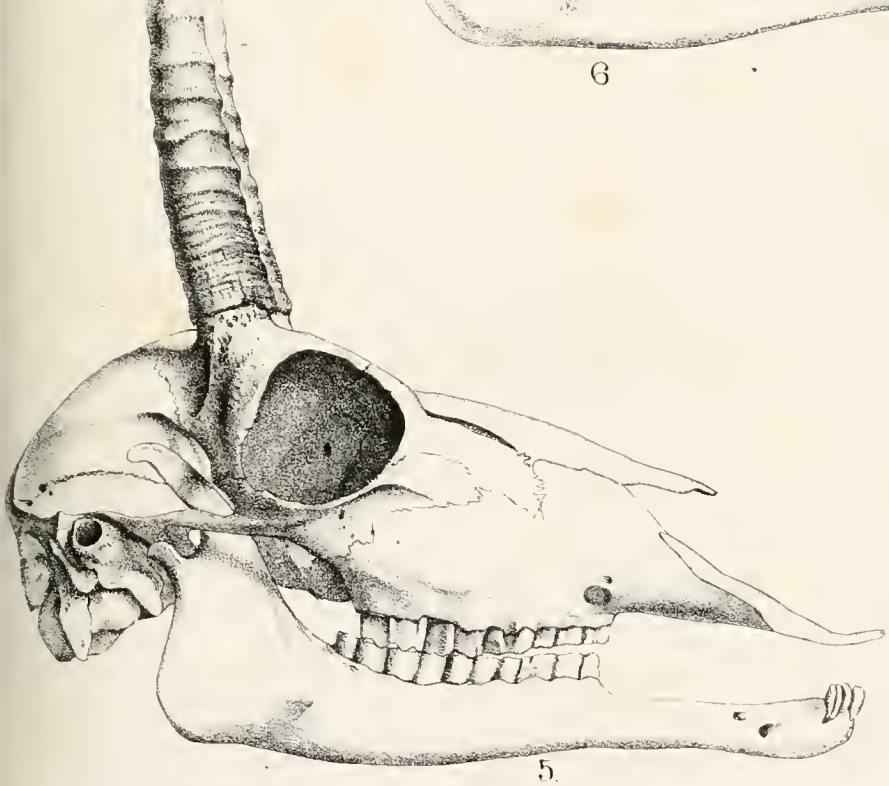


C.H.Ford. Mintern Bros. imp.

3 Cervulus Reevesii 4 Adenota Lechee. ♀.

6



5.

G.H.Ford.

Mintern Bros. imp.

5 Peha capreola. 6 Damahs pygarga.

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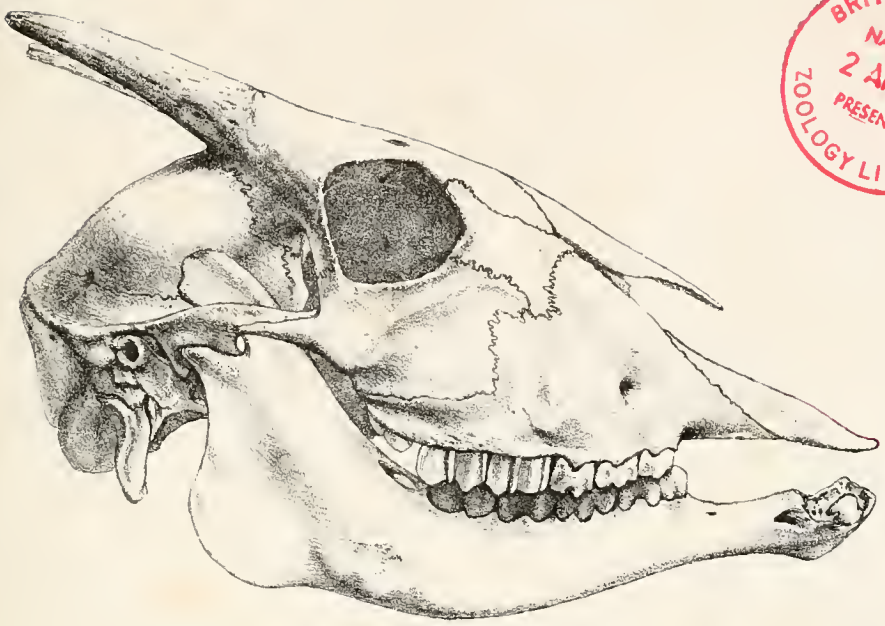

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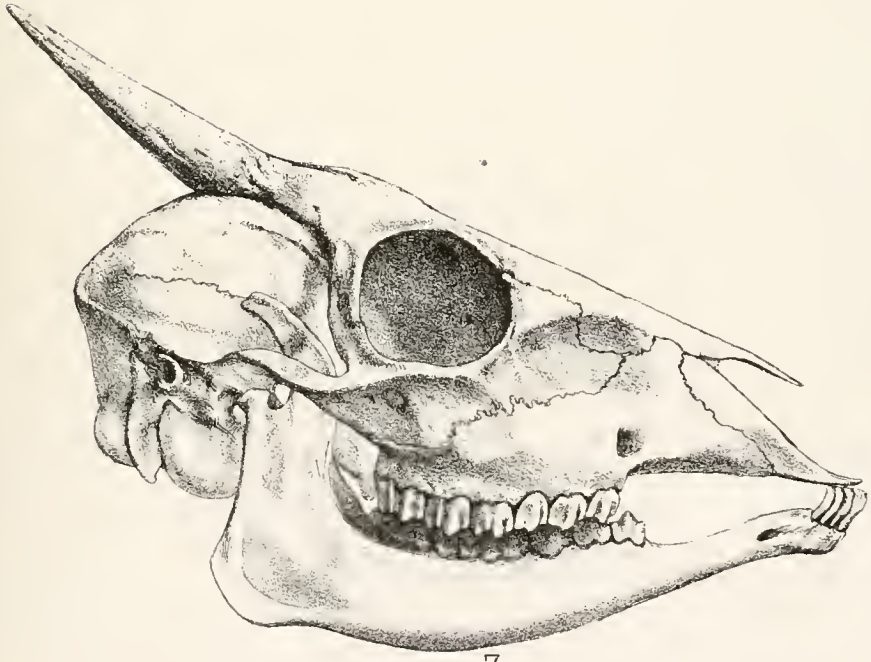

7

G.H.Ford

Mintern Bros imp

7. Grimmia madoqua. 8. Urotragus caudatus.